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# Journal of the Society of Arts.

FRIDAY, MARCH 5, 1869.

## Announcements by the Council.

### ORDINARY MEETINGS.

Wednesday Evenings at eight o'clock :—

MARCH 10.—“On the Screw Propeller.” By N. P. BURGH, Esq., C.E.

MARCH 17.—“On the Trade and Commerce of Japan.” By WILLIAM DAVISON, Esq.

MARCH 24.—*Passion Week*.—No MEETING.

MARCH 31.—“On Technical Education, considered in relation to Female Schools.” By ELLIS A. DAVIDSON, Esq., Lecturer on Science and Art in the City of London Middle Class Schools.

APRIL 7.—“On the Theory of Boiling in connection with some processes in the Useful Arts.” By CHARLES TOMLINSON, Esq., F.R.S., F.C.S.

### FINAL EXAMINATIONS, 1869.

In order to avoid holding these Examinations on the same evenings as those of the Department of Science and Art, it has been decided to hold them, in 1869, on the evenings of

**TUESDAY, the 20th APRIL,**  
**WEDNESDAY, the 21st    ,,**  
**THURSDAY, the 22nd    ,,**  
**FRIDAY, the 23rd     ,,**

From 7 p.m. to 10 p.m., instead of on the 27th, 28th, 29th, and 30th April, as announced in the Programme of Examinations for 1869.

In consequence of this alteration the Previous Examinations must be held forthwith, in order that the Forms No. 2 and No. 4, referred to in par. 6 of the Programme, may be sent in earlier.

A copy of Form No. 2 has been forwarded to each Local Board, and should be filled up and returned to the Secretary of the Society of Arts by the 11th inst.

A sufficient number of applications from candidates in all the subjects referred to in the notice at page 9 of the Programme having been received, papers will be set in Conic Sections, Navigation and Nautical Astronomy, Mining and Metallurgy, and Italian.

Local Boards having candidates either in the “Theory of Music” or in “Elementary Musical Composition (Tonic Sol-fa System),” should communicate with the Secretary of the Society of Arts immediately.

### FREE LIBRARIES AND MUSEUMS.

The Council have appointed a Committee to consider and report how the Society may aid in promoting the establishment of Free Libraries

and Museums of Science and Art throughout the United Kingdom.

The following gentlemen have been invited to serve on the Committee :—

T. D. Acland, M.P.	*George Godwin, F.R.S.
*Antonio Brady, Member of the Council.	Lord Henry G. Lennox, M.P., Chairman of the Council.
Professor Brayley.	Sir John Pakington, Bart., M.P.
*The Lord Chancellor, Vice-President of the Society.	Charles Reed, M.P.
*Hyde Clarke, Member of the Council.	*Samuel Redgrave, Vice-Pres. of the Society.
*Henry Cole, C.B., Vice-Pres. of the Society.	*Seymour Teulon, Member of the Council.
*Sir Daniel Cooper, Bart., Member of the Council.	*James T. Ware, Member of the Council.
*Chas. Wentworth Dilke, M.P.	*General Eardley Wilmot, R.A.
Hepworth Dixon.	*The Archbishop of York, Vice-President of the Society.
*Captain Donnelly, R.E.	
Captain Festing, R.E.	

\* Those gentlemen whose names have an asterisk (\*) have already consented to serve on the Committee.

### THAMES EMBANKMENT COMMITTEE.

The Council have appointed a Committee to report upon the best way of dealing with the Thames Embankment, so that the opportunity may not be lost of making this noble site conducive to the embellishment and improvement of the metropolis.

The following gentlemen have been invited to serve on the Committee :—

The Archbishop of York, Vice-Pres. of the Society.	*Henry Cole, C.B., Vice-Pres. of the Society.
The Duke of Buccleuch, K.G., Vice-Pres. of the Society.	*C. W. Dilke, M.P.
Lord Henry G. Lennox, M.P., Chairman of the Council.	*W. R. Drake, F.S.A.
*The Lord De L'Isle and Dudley, Vice-Pres. of the Society.	Lieut.-Col. Ewart, R.E.
*Lord Elcho, M.P.	*Alderman Sir T. Gabriel.
*Baron Meyer de Rothschild.	*W. H. Gregory, M.P.
Rt. Hon. Russell Gurney, Q.C., M.P.	Thomas Hughes, M.P.
The Hon. Auberon Herbert.	Sir John Lefevre, K.C.B.
*A. B. Beresford Hope, M.P.	*John Locke, M.P.
*William Boxall, R.A.	*J. E. Millais, R.A.
*Sir William Bodkin, Assistant-Judge, Vice-Pres. of the Society.	*S. Redgrave, Vice-Chairman of the Council.
Montague Chambers, Q.C., M.P.	John Ruskin.
	Alderman Salomons, M.P.
	*Lieut.-Col. Scott, R.E.
	*Seymour Teulon, Vice-Chairman of the Council.
	*Sir Charles Trevelyan, K.C.B.
	John Walter, M.P.
	*Richard Westmacott, R.A.
	*Joseph Whitworth, L.L.D.
	*Watkyn Williams, M.P.

Those gentlemen whose names have an asterisk (\*) have already consented to serve on the Committee.

### ARTISTIC COPYRIGHT.

Lord Westbury has presented to the House of Lords the Bill “for Consolidating and Amending the Law of Copyright in Works of Art,” pre-

pared under the direction of the Council, and the second reading has been fixed for the 12th instant.

#### SUBSCRIPTIONS.

The Christmas subscriptions are due, and should be forwarded by cheque or Post-office order, crossed "Coutts and Co.," and made payable to Mr. Samuel Thomas Davenport, Financial Officer.

#### ART-WORKMANSHIP COMPETITION, 1869.

The following is the report of the Judges, Messrs. George Godwin, F.R.S., Richard Redgrave, R.A., and Sir Digby Wyatt:—

In spite of the individual specimens of excellence, to which we shall presently allude, we are bound to confess that the response made by art-workmen to the Society's liberal invitation to compete for prizes offered during the last session, cannot, in our opinion, be regarded as satisfactory.

It will be remembered that the lists of subjects proposed differed materially from those of previous years—it having been considered well, as an experiment, to test the workmen's powers in the combination of original design with skilful workmanship, and in novel directions, rather than to keep them in the groove of the reproduction of the best works of the past.

We deemed some change of this nature requisite, from our observation that, while a fair level of mechanical perfection had been attained by the workmen generally, no such marked progress was realised from season to season as to justify the continued application of the large annual outlay made by the Society, in the attempt to foster and effect the improvement desired, but which could scarcely be said to have manifested itself.

Whether it is that the task recently set to the art-workmen has been beyond their present powers, or, as is more probable, that they look with anxiety only to what affects their regular employment, possibly, in some cases, apprehending notoriety as a fault rather than merit in their masters' eyes, certain it is that the results of their labour, taken as a whole, are not such as we had hoped for, nor such, by any means, as we think would have been made by French, or even Belgian workmen, had a similar invitation been addressed to them.

We do not necessarily attribute this to incapacity on the part of our art-workmen as executants, but ascribe it rather to their want, in this case, of the directing and sustaining power which is supplied to them, in the course of ordinary business, by the superior education and attainments of their masters and the artists and designers, from whose drawings, models, or suggestions, they may habitually work.

That it would be a national gain for British workmen to acquire that measure of facility in the application of skilled workmanship which distinguishes so highly the best class of foreign workmen, no one would probably deny. It was to encourage development in this direction that the modification, to which allusion has been made, was introduced into last year's programme.

The response being, in our judgment, so uncheering, we feel bound to recommend to the Society of Arts either a return to former programmes, or such a change in the conditions of their invitation as should recognise and reward not only the skilled workmen, but the talent and energies also of the masters, through whose application of capital and knowledge such workmen might be brought to the production of the real excellence and novelty we had hoped to have seen united in the present exhibition. We are emboldened to make the above suggestion in the full conviction that no such radical change is likely to be adopted without receiving that careful consideration at the hands of the Council of the

Society of Arts, possibly after conference with us, which its importance may justify.

In the first division, "Specimens of Art-Workmanship in Prescribed Processes," we have recommended such rewards to be given as we considered right under the circumstances, but we do not feel justified in dwelling at length upon any of the specimens so rewarded.

Mr. Thomas Godfrey's panel for a cabinet, consisting of six different woods, is skilfully carved in delicate relief, in a manner familiar enough to French, Italian, and Spanish workmen, but not, as yet, common in this country.

In the second division—"Specimens of the Application to Ordinary Industry of Prescribed Art Processes," we regard as by far the most hopeful product, "the slab for insertion in the frieze of a chimney-piece," painted on a red tile, by Mr. J. B. Evans.

Considering the almost universal application of the processes of enamelling on metal in France, and the strides made at Birmingham in the industrial application of the process, we had certainly expected more important contributions than those forwarded by Mr. Frederick Lowe. They being the best and, the ring-tray in particular, being satisfactory both in design and execution, we have considered him entitled to a reward of ten pounds, but we are certainly unable to regard either specimen as "most beautiful."

Some of the clock dials exhibited by Mr. J. Thwaites, are agreeable in design and pleasing in execution. The collection is, however, of singular inequality in point of merit in design.

Mr. W. H. Slater's blackware slab, painted with the subject of "Pluto," is of good average execution.

Among the subjects sent in for exhibition, but not wrought in accordance with prescribed processes, the most to be commended, by far, is the painting on china, "Giving a Bite," after W. Mulready, R.A., by Mr. W. P. Simpson; it is an admirable specimen, although not a very important one as to size, of painting on porcelain, and we have awarded to it "The North London Exhibition" prize, in addition to a sum of five pounds from the Society of Arts.

We were particularly pleased with the delicacy of the modelling of the subjects "St. Cecilia," and the "Virgin and Child," after Donatello, by "W. W.," we considered these to be admirable specimens of cabinet modelling.

We were much pleased with the steel die sunk by G. Morgan, after the head of a female modelled from life by himself; we regarded this as a work of great promise in a branch of art too little practised or considered at the present date.

Mr. John Barker's bracket, carved in Caen stone, and his flowers, and some carvings in marble, executed by "W. X. D.," were satisfactory.

Mr. Robert Taw's embossing in copper of a yacht in full sail, showed both taste and skill, although we regarded the form in which they had been brought to bear on the present occasion to be rather a misapplication of both.

Mr. Thomas Wills' alto-relief in boxwood, with an ebony border, of "Venus Genitrix;" Mr. Decere's renaissance ornament in copper; Mr. Eyre's painting on porcelain of the "Death of Goliath;" and Mr. Emms' wrought-iron-work for cabinet, were also commendable.

GEORGE GODWIN.

RICHARD REDGRAVE.

M. DIGBY WYATT.

The following is a list of specimens sent in competition, with the Prizes awarded:—

*Works sent in in Accordance with the Prescribed Processes.*

#### FIRST DIVISION.

1. (D.) Earthenware Slab, with figures painted in enamel colours. By J. B. Evans, Howd-place, Shelton, Staffordshire Potteries. Price £4 4s.

2. (E.) Earthenware Vase, with painted ornament in enamel colours. By the above. Price £8 8s. **PRIZE of £2.**
3. (M.) Design in Ivory and Gilt Metal-work, for cover of an album. By George Berry, 31, Brewer-street, Golden-square, W.
4. (N.) Clock Case, in amboyna and purplewood, with inlay of ivory. By Thomas Jacob, 4, Upper Charlton-street, Fitzroy-square, W. **PRIZE of £5.**
5. (N.) Marquetrie Panel. Designed and inlaid by F. Braun, 12, Star-street, Edgware-road, W. Price £9. **PRIZE of £2.**
- 5A. (P.) Centre of a Chimney-piece, a combination of mosaic and inlay with carved stone. By John E. Daly, 33, Medway-street, Westminster, S.W. **PRIZE of £5.**
6. (Q.) Panel for a Cabinet, consisting of six different woods. Designed, carved, and inlaid by Thomas Godfrey, 21, Chatham-road, Wandsworth-common, S.W. **PRIZE of £5.**
7. (Q.) Panel for a Cabinet. By Charles Line, 41, Prince of Wales's-crescent, N.W. Price £12. **PRIZE of £4.**
8. (Q.) Panel Frame, carved in various woods. Designed and carved by E. T. Grove, 130, Albany-street, N.W. Price £5.
25. (O.) Pedestal for a Bust, forming a clock case, consisting of carved marble combined with mosaic. By W. H. Barrett, 2, Alma-terrace, Fentiman-road, S.E. Price £18.

*Subjects sent in for Exhibition, but not in Accordance with the Prescribed Processes.*

#### CARVING IN STONE.

26. Bracket, carved in Caen-stone. By John Barker, 2, Paradise-street, Lambeth, S.E. **PRIZE of £5** for the exhibit of this and Nos. 27 and 28.
27. Panel of Flowers, carved in Caen-stone. By the above.
28. Panel, carved in Caen-stone. By the above.
29. Child's Head, carved in Stone. By John Wallace, 162, Grove-street, Camden-town, N.W. Price £4 10s.

#### CARVING IN MARBLE.

30. Boy's Head, in Relief, a Portrait. By W. X. D. Price £2. **PRIZE of £4** for the exhibit of this and No. 31.
31. Medallion Head of Michael Angelo. By W. X. D. Price £2.
32. Bust of Queen Adelaide. By G. Bool, 9, Warwick-place, Pimlico, S.W. Price £12.
33. Carving in Relief. By Owen Thomas, 66, Harewood-street, N.W. **PRIZE of £1.**

#### MODELLING IN PLASTER.

3. (A.) Cases of Specimen Clock Dials. Nos. 1 to 6 enamel painted; Nos. 7 and 8 dead surface suitable for public buildings, as not reflecting the light; Nos. 9 to 11 glass dials in imitation of engraved dials, and superior to them for durability in consequence of the work being at the back. All the dials can be produced in any size. By J. Thwaites, 38, Spencer-st., Clerkenwell, E.C. **PRIZE of £5.**
10. (B.) Frame for a Miniature, of strongly-giltgilding-metal and enamelled; solder of 18 carat gold. Designed, traced, engraved, and enamelled by Frederick Lowe, 13, Wilderness-row, E.C. **PRIZE of £10** for the exhibit of this and No. 11.
11. (C.) Ring Tray, similar in material and process to the above. By Frederick Lowe.
12. (D.) Slab, for insertion in the frieze of a chimney-piece. By J. B. Evans, Howard-place, Shelton, Staffordshire Potteries. Price £6 6s. **PRIZE of £10.**
13. (D.) Ditto. By the above. Price £4 4s.
14. (D.) Ditto. By John Slater, Field-place, Stoke-on-Trent. Price £6 6s.
15. (D.) Ditto. Painted Birds, after Bouvier. By Frank Harris, Hartshill, Stoke-on-Trent. Price £1 11s. 6d.
16. (D.) Ditto. Painted Trophies, birds &c., with green ground-laid border, with gilt raised ornamentation. By the above. Price £3 13s. 6d.
7. (D.) Ditto. "The Virgin and Child;" after Titian. By "Pax."
18. (D.) Ditto. Figures. By W. P. Simpson, 6, Queen's-road, Bayswater, W. Price £10 10s.
19. (D.) Ditto. Flowers. Painted by J. Longmore, 14, Hardinge-st., Fenton, Stoke-on-Trent. Price £1 1s.
20. (D.) Ditto. "Pluto." Painted on blackware, after the style of the Limoges Enamels. By W. H. Slater, James-st., London-road, Stoke-on-Trent. **PRIZE of £5.**
21. (E.) Tablet for Monumental or Commemorative Purposes (unfinished, but sent to show design). By James Griffiths, Field-place, Stoke-on-Trent. **PRIZE of £2.**
22. (H.) Book Cover, enrichment in gold upon coloured ground. By C. Pfander, 28, Bayham-street, N.W. Valued at £3 10s. **PRIZE of £3** for the exhibit of this and No. 23.
23. (H.) Ditto, enrichment in cameo tints upon black and gold grounds. By the above. Valued at £3 15s.
24. (I.) Set of Fire-irons. By E. Millard, 35, Little Clarendon-street, Clarendon-square, N.W.
34. Bust, "Ophelia." By A. J. Smith, Great Northern Stone Wharf, Wharf-road, King's-cross, N.
35. Modellings, after Donatello, of St. Cecilia, and the Virgin and Child. By W. W. Price £5. **PRIZE of £5.**
36. Portion of Ornament. By E. Gibbons, 5, Mary-street, Arlington-square, N.
37. Medallion, "Science Trimming the Lamp of Life," executed after cast of medal by Wyon. By R. C. Hindshaw, 23, Worsley-street, Regent-road, Manchester. Price £10.
38. Frame containing six emblematical figures of the Months. Designed and modelled by G. Morgan, 41, Pelham-street, Brompton, S.W.
39. Head of a Female, modelled from life. By the above. **PRIZE of £5** for this in combination with No. 40.

#### METAL WORK.

40. Reduced copy in steel of the above. By the same exhibitor.
41. Embossing in Copper of a Yacht in full sail. By Robert Taw, 8, Prince of Wales's-crescent, N.W. **PRIZE of £2.**
42. Wrought Iron Work for Cabinet. Designed by B. T. Talbot. Executed by G. Emms, 2, King-street, Old Kent-road, S.E. **PRIZE of £1.**
43. Repoussé Work in Copper. By J. Gwillim, 19, Sidney-square, Mile-end, E. Price £20.
44. Renaissance Ornament in Copper. By G. Deere, 23, Weston-street, Pentonville, N. Price £10. **PRIZE of £2.**
45. Specimens of minute engraving. The Creed, the Lord's Prayer, and the Ten Commandments. Engraved by hand, in black letter, on threepenny pieces. By W. Roberts, 146, Stanhope-street, Hampstead-road, N.W.

#### CARVING IN WOOD.

46. Head of our Saviour, carved in lime wood. By E. J. Broughton, 23, Queen-street, Webber-street, S.E. Price £3 10s.
47. Alto-relief in box-wood with ebony border, "Venus Genetrix." By Thomas Wills, New-road, Hammersmith, W. Price £15. **PRIZE of £3.**
48. Bust of a Female in lime-wood. By William Cushing, 14, Cardington-street, N.W.
49. Panel of Flowers. Carved by Arthur Line, 19, Prince of Wales's-crescent, N.W. Price £4 10s.

50. Clock Case in walnut wood. By R. Flipping, 67, Charrington-street, N.W. Price £7.  
 51. Highland Dirk, carved in ebony. By John Sinclair, 6, Sutherland-street, West-end, Edinburgh.  
 52. Presentation Pipe, carved in syncamore. By the above.

## NEEDLEWORK.

53. Specimen of Needlework for a Book-cover. By Miss H. Pfander, 28, Bayham-street, N.W. Price £3 5s.

## PAINTING ON PORCELAIN.

54. "The Death of the Christmas Carol Singer." By J. J. Slater, Ricardo-street, Burslem, Staffordshire. Price £10.  
 55. "The Death of Goliath." By John Eyre, 16, Newman-street, Oxford-street, W. Price £5 10s. PRIZE of £2.  
 56. "Giving a Bite;" after W. Mulready, R.A. By W. P. Simpson, 6, Queen's-road, Bayswater, W. Price £26 5s. PRIZE of £5. Also the "North London Exhibition Prize."\*  
 57. Study from Life. By W. P. Rhodes, Liverpool-road, Newcastle-under-Lyne.  
 58. Portrait from a photograph, worked with a crayon on a glazed surface, and fired. By A. B.  
 59. Portrait from a photograph. By the above.  
 60. Head of Our Saviour, from an engraving by Sharp, after Guido, by the same process as No. 58. By the above. PRIZE of £2.

## COMMITTEE ON INDIA.

This Committee has resolved that Six Conferences be held during the present Session for the discussion of the following subjects, viz. :—

Tea Cultivation in India.  
 Hill Settlements and Sanitaria.  
 Waste Lands in India.  
 Trade with Central Asia, Thibet, and South-Western China.  
 Indian Fibres.  
 Silk Cultivation and Supply.

The following evenings have been fixed for holding the conferences :—

Friday, March 12th.  
 " April 2nd.  
 " April 16th.  
 " April 30th.  
 " May 14th.  
 " May 28th.

At these Meetings the chair will be taken at 8 o'clock, and the discussion will be opened by a paper.

On the first evening, Friday, March the 12th, Mr. C. H. FIELDER, Hon. Secretary of the India Tea Association, will open the discussion with a paper "On Tea Cultivation in India." The subjects for each subsequent evening will be previously announced in the *Journal*.

Members of the Society interested in Indian questions are invited to attend.

## Proceedings of the Society.

### PISCICULTURAL COMMITTEE.

The Council, having had brought under their consideration the importance of Pisciculture, as

\* This Prize consists of £4 17s. 10d., being the interest of £167 7s. 3d. Consols invested in the name of the Society of Arts, to be awarded by the Council "for the best specimens of skilled workmanship" at the Society's Exhibition.

affecting the rearing, breeding, and preservation of fish, and thus influencing the supply of food to the people of this country, have appointed a Committee on the subject, and the gentlemen whose names are given below have been invited to serve upon it :—

\*Edmund Ashworth.  
 \*Thos. Ashworth.  
 \*Redmond Barry.  
 \*A. D. Berrington.  
 J. A. Blake, M.P.  
 Rev. H. Blissett.  
 \*T. F. Brady.  
 \*Earl of Breadalbane.  
 \*Frank Buckland.  
 Higford Burr.  
 James Caird.  
 Marquis of Clanricarde.  
 \*E. W. Cox, M.P.  
 George Clive, M.P.  
 J. Dodds, M.P.  
 Sir P. de Malpas G.  
 Egerton.  
 \*Richard Foster.  
 \*Francis Francis.  
 \*H. George.  
 Rt. Hon. T. Milner Gibson,  
 M.P.  
 \*Richard Gibson.  
 \*Dr. Günther.  
 \*G. W. Hart.  
 \*Charles Hambro.  
 S. Hart Jackson.  
 \*Henry Lee.  
 G. S. Lefevre, M.P.  
 Sir Coutts Lindsay, Bart.  
 \*J. Lloyd, jun.  
 \*Harry Lobb.

\*J. Keast Lord.  
 \*Col. Lyne.  
 \*A. P. Manley.  
 Earl of Mansfield.  
 Dr. Mitchell.  
 A. Mostyn Owen.  
 Duke of Newcastle.  
 \*J. Paterson.  
 \*Dr. Peard.  
 \*W. Pease, jun.  
 A. F. Pennell.  
 \*H. Cholmondeley Pennell.  
 \*J. S. Phillips.  
 \*Hon. Edwin B. Portman.  
 G. P. R. Pullman.  
 \*Wm. Pullman.  
 Duke of Roxburghe.  
 \*Major Scott.  
 Earl Somers.  
 H. Spackman.  
 Viscount Stormont.  
 The Duke of Sutherland.  
 \*J. F. Symonds.  
 \*H. Tegetmeier.  
 J. Tomline.  
 G. R. Waterhouse.  
 G. F. Wilson, F.R.S.  
 B. Wood.  
 \*B. Woodman.  
 \*Robert Worthington.  
 \*J. Youl.

Those gentlemen whose names have an asterisk (\*) have already consented to serve on the Committee.

The Committee met on Wednesday, the 3rd inst., at two o'clock. Present :— Mr. Frank Buckland in the chair; Messrs. Jas. A. Youl, A. D. Berrington, F. Chadwick, J. W. Willis Bund, E. P. Lindon, Robt. Worthington, Henry Lee, J. Wayson, T. F. Brady, G. W. Ward, B. Woodman, J. E. Walker, B. Price Jordan, Capt., Spratt, R.N., Col. Lyne, G. F. Wilson, F.R.S., Major Scott.

The CHAIRMAN said he was glad to meet so many gentlemen connected with the English fisheries, and with regard to the object they had more particularly in view at that time—namely, the desirability of joining the deputation to the Home Office upon the question of the Amendment of the Salmon Fishery Laws, it was exceedingly desirable that some united action should be taken to impress upon the Government the importance of protecting the English fisheries. There were many questions that needed ventilation, and he hoped they would be taken up—the questions of weirs, lower and upper proprietors, the water rights of manufacturers, pollution, &c.

Mr. A. D. BERRINGTON supported strongly the objects of the deputation, and thought that trout required greater protection, and the fishing for trout required amendment.

Mr. FRANCIS FRANCIS said that a supervision of nets was needed. Any legislation was useless unless certain

nets were prohibited; and no Act was worth anything that did not deal with them.

Mr. CHADWICK said the question of nets was one of the points he was instructed by his board to press, and advocated the change of the size of the mesh from two inches to three inches. He thought the weekly close-time was too short, and advocated its commencing at 6 p.m. on Fridays, and ending at 6 a.m. on Mondays. He also dwelt on the difficulty there was in obtaining prosecutions; the penalties were so small that manufacturers often found it to their interest to pollute the water and pay the penalty.

Mr. J. F. BRADY thought that it was all a question of bye-law, there were so many different things to be considered with regard to each river, that it was impossible almost to legislate for the whole, unless the peculiarities of each were taken into account.

Mr. FRANCIS FRANCIS moved the following resolution:—"That a deputation from the Society of Arts Committee attend to support the deputation to the Home Secretary on Thursday, the 4th March."

The resolution was carried.

#### EXTRA MEETING.

Monday Morning, March 1st, 11 a.m.; A. J. MUNDELLA, Esq., M.P., in the chair.

The second adjourned discussion on Mr. HENRY COLE's paper "On the Efficiency and Economy of a National Army, in connection with the Industry and Education of the People," read on Wednesday evening, the 17th February, was opened by

Sir CHARLES TREVELYAN, K.C.B., who said that on a previous occasion he had pointed out that the alternative was between a standing army with a long period of service, and a popular army with short periods of service, instruction, and morality. He then touched on the leading characteristics of a standing army, and remarked that in the case of a popular army all these characteristics were reversed. Under the present system of a standing army we could only place in the field about 40,000 men, while it was requisite, in order to balance in any way the power of France, with her 800,000 men, that at least 400,000 men should be at our command, which, at the same rate of expenditure, would cost 150 millions, the mere mention of which was an absurdity. It was evident, therefore, that we must have recourse to another plan, which would be to bestow our principal pains and expenditure, not on the army at large, but on a small picked force, or *cadre*, chosen for the purpose of instruction, who would, in their turn, be the instructors of others. The object was to obtain the greatest number of possible soldiers with the least number under arms; to keep a small army on an active footing, to be reinforced on emergency from large reserves. All branches of such an establishment together, came, of course, to an enormous total; but such a force, nevertheless, represented only that cheap defensive organization on which many States were now bent, and to which all must be driven some day or other if financial ruin was to be averted. Austria was the last nation to adopt this model, which she had done within a few months. Formerly a man was liable to serve in the regular army for eight years, during which time he could neither marry nor follow his ordinary avocation, and at the end of that time he still remained two years in the reserve; now he only had to serve three years in the regular army; and whilst he remained in the reserve, which he did for seven years, he followed his ordinary occupation, being simply called out a few weeks in each year for exercise, so that in spite of the great increase in numerical strength, the new system was economically a gain and not a loss. The difference between the two

systems might be well illustrated by the operations of a miller; if he only ground as much corn as he could store in his own buildings his operations would be very limited, but, so far from that, he went on grinding to meet the necessities of the whole country. In the same way, with a system of *cadres* of instruction, we could go on "grinding" soldiers to any amount required. Again, the two systems were opposed to each other in the matter of the age of the soldier. With a standing army you must have a long, with a popular army only a short, period of service, the one priding itself on its veterans, the other on its youthful and vigorous men. And what was the experience of mankind on this subject? Going back to the ancient Greeks, who were renowned above all other nations for their military achievements, they were all familiar with the famous pean or warlike hymn of Tyrtæus, which spoke in a spirit-stirring strain of its being a shame to see an aged man slain in front of the battle, while it was a glory to the youth. The passage he referred to was as follows:—

αἰσχρὸν γὰρ δὴ τοῦτο μετὰ προμάχοισι πεσόντα  
κείσθαι πρόσθε νέων ἄνδρα παλαιότερον,  
ἤδη λευκὸν ἔχοντα κάρη πολίον τε γένειον,  
θυμὸν ἀποπνεύοντ' ἄλκιμον ἐν κονίῃ,

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αἰσχρὰ τὰ γ' ὀφθαλμοῖς καὶ νευροσπῆτον ἰδεῖν—  
καὶ χροὰ γυμνωθέντα· χροαὶ δὲ πάντ' ἐπέουκεν,  
ὕψρ' ἐρατῆς ἥβης ἀγλαδὸν ἄνθος ἔχῃ.  
ἀνδράσι μὲν θνητὸς ἰδεῖν, ἐρατὸς δὲ γυναιξίν,  
ζῶς ἐὼν, καλὸς δ' ἐν προμάχοισι πεσών.

Again, in India, and amongst all Mahomedan nations, the name of a soldier was Jawân, which was synonymous with youth, and in the most military nation in Europe, happily our own countrymen, the Irish, the expression that went most to their hearts in speaking of any deed of prowess was, that "the boys" had done it. He might also refer to General Trochu's captivating, but deeply reasoned, chapters on "Jeunes Soldats et vieux soldats" and "Les grognards du premier Empire," which supported the same view with reference to the youth of the soldier. Perhaps some lady would translate them with the grace which always belongs to the practised female pen, and publish them in a separate form under the auspices of the Society. It was an old observation that battles were gained as much by the legs as by the arms of the combatants, and if that were true formerly, it was much more so now, when so much depended upon getting under cover, for with the present arms of precision and rapidity the men were rather mowed than shot down when exposed to the fire of the enemy. In comparing a popular with a standing army, one of the most important points was economy, and, first of all, with respect to the effect on the labour market. To permanently withdraw 200,000 men must be a great loss to productive industry, but, under the system he proposed, no one would be permanently withdrawn from productive labour but the officers, commissioned and non-commissioned, forming the instructional *cadres*, and the loss from that source would be far more than compensated by the fact that the labourer, when passed through this instructional course, became in consequence much more valuable. Such was the experience both of Prussia and France, where it was found that the peasants, after a few months' association with their comrades, were turned out far more efficient, not only in a military point of view, but in regard to all the business of life, in fact, their services were eagerly sought after, and it could hardly be said that our English clodhoppers were not as much in need of a little brightening up as the French *paysans*. In fact, under the system of a national army all might be said to be bees, and none drones. As he had before remarked, all military establishments were greatly increased in costliness, first, from

the general rise of wages; secondly, from the higher standard of comfort which now prevailed; thirdly, from the happily higher standard of morality and humanity which, from the exertions of philanthropists, was now applied to the army; and, fourthly, from the increased cost of scientific arms and munitions of war. What did they do in other affairs of life when they found themselves saddled with the expense of a costly article? The obvious course was to husband it to the utmost, and make it go as far as possible. Colonel Leahy had calculated that the expense of *old* soldiers was ten times that of *reserved* soldiers, so that, on this principle, they would have 400,000 trained reserve men, on the system of a popular army, for every 40,000 on the system of a standing army. In fact, it was the mill over again, in the one case the process being continuous, and a certain number of trained soldiers being turned out every year, while in the other the operation stopped at a very limited number. On the question of morality, the moral defects of the present system were really too painful to dwell upon, and he would therefore at once pass to the change which would take place if the system of a popular army were adopted. The bounty money, drinking, and wheedling, would all be eliminated from the recruiting system, and the soldier's engagement would be put on the footing of an honest well understood contract, like that which was made with the police, or which their respected Chairman or any other employer of labour entered into with his workmen. He might here pay a well-deserved tribute to a gentleman who had lately passed from among them, Mr. Godley, a man who united in a very high degree philosophical and practical qualities, and who added to them a spirit of Christian philanthropy, which led him to apply those talents to the improvement of the condition of his fellow creatures. It was from this gentleman that his strong opinions on the present system of recruiting were derived, and happily Mr. Godley's views were fully recorded in the report and appendix of the Recruiting Commission. As to the class of confirmed reprobates in the army—not the loose young men who were in many cases much improved if not reformed by discipline, but the confirmed blackguards—the army, with its high feeding and gentlemanly leisure, was the last place for them. They were the last class of men who should be exempted from the common lot of humanity, to eat their bread in the sweat of their face. The place for them was at the plough of the day-labourer, or the pick-axe and the barrow of the navvy. As he proposed to remodel the army, it would be a place only for industrious and well conducted men. The commissioned officers would be employed in teaching the theory of their profession, the non-commissioned in teaching the practice; and the men in learning both theory and practice; and when this system was once adopted there would be no need to seek out of the way modes of employing the men in various industrial occupations. The motive for this desire was an excellent one, but the real business of a soldier was soldiering, and this truth could not be too much insisted on. Division of labour was as valuable in the army as elsewhere, and the only reason why it was suggested that soldiers should be employed as handicraftsmen was because they were kept too long in the army; when they were only kept long enough to become thorough soldiers, such expedients would be no longer necessary. The ordinary soldier would, under the system he proposed, serve for one year only, which would be long enough for him to acquire a thorough knowledge of his duties, and those who remained long would be occupied in teaching the one year's men, and would then have prospects of employment in the civil service. The leading idea connected with an "old soldier," especially in the minds of English mothers, was that of a demoralising agent, but this would be entirely reversed when the old soldiers were those only who were permitted to remain on account of good character and conduct, and who were permitted to marry. In

fact, the term "old soldier," would become one of honour rather than reproach, and would imply a high moral character instead of a low one. All the young soldiers would be so fully occupied with the novelty of their situation, the necessity of learning their duties, musketry instruction, &c., that they would no more think of marrying than did an undergraduate in his first year at college. An article which appeared some years ago in the *Edinburgh Review*, when the regeneration of Italy first awakened attention, accounted for the remarkable position held by Piedmont, a small state, sitting astride the Alps, by the military discipline which all her sons underwent. The same training was now looked to for converting the semi-barbarous Calabrians and Sicilians into orderly and obedient subjects. This had been the experience of other countries, especially of France, and he doubted not it would be the same in England when once the system was adopted. English rustics, with many good qualities, which placed them at least on a level with the peasantry of other countries, had a certain stolidity about them which military training was eminently calculated to remove. He did not hesitate to say that the finest corps in Her Majesty's service was, not the Guards, nor the Artillery, nor the Rifles, but the Irish Constabulary, consisting of 12,000 men. An officer of the Guards dare not send a single man, taken indiscriminately from the ranks, alone on any particular duty, but this was constantly done with the Irish Constabulary, and with the fullest assurance that the man would do his duty soberly and to the best of his ability, and then return immediately to render an account of his trust. There was no reason why the whole army should not be elevated to the same position. Sir Charles Trevelyan said he would not refer again to marriage, which had better be read than talked about. He had said all he had to say about it in the early part of the fourth chapter of his last pamphlet. This was a vital point in the reform of the army, and the most decisive proof of the soundness of the mode advocated by him was that the young soldiers, who would be the great majority, would not care to marry, while the old soldiers would all be permitted to marry. Then came the important question as to the precise model they would adopt. The measures suggested by him might be arranged in two classes: The first class consisted of measures intended to render our military system more efficient, to improve the organisation of the different descriptions of force of which the army was composed, and to perfect the methods of instructing and training the troops. The second class consisted of measures intended to render the conditions of military service more attractive, and to procure an abundant supply of recruits from all classes of the population without departing from the voluntary principle, or having recourse to conscription. Under the first class he included—1. The organisation of our military forces on the basis of assigning to each county or other territorial division a separate military establishment. 2. The formation of composite county regiments, each consisting of one or more battalions of troops of the line, of one or more battalions of militia, and of one or more corps of volunteers. A permanent quarter within the district to be assigned as the station of the head quarter or depot battalion of each of these composite regiments. 3. The recruits, both of the line and of the militia battalions, to be trained together at this head-quarter depot, which should be furnished with school-rooms, lecture-rooms, a gymnasium, rifle-practice ground, a spacious parade, and with all other appliances of a great training establishment; also with a military club for the use of all commissioned officers of the county regiments, whether belonging to the line, the militia, or the volunteers. 4. The training of recruits at the depot battalion, to consist not only of military exercises, but also of intellectual instruction. Officers of militia and of volunteers to be required to qualify by going through a prescribed course of military instruction at the depot.

5. Battalions of the line to consist of soldiers engaged for a term of seven years' continuous service at home or abroad. 6. Non-commissioned officers, and a small percentage of picked soldiers, to be eligible for re-engaging for a second term of service. 7. The militia battalions to consist, first, of men transferred from the line battalions after the completion of their term of seven years' service, and, secondly, of recruits enlisted for one year's continuous service at the depot, followed by a term of ten years' militia service, during which they would be forced to assemble for training for a certain number of days in each year, and they would be liable in time of war to be embodied for continuous service. In the second class of measures, those intended to render military service attractive, were included—1. The reduction of the term of the soldiers' engagement from twelve to seven years. 2. The abolition of the purchase of commissions. 3. To raise the pay of officers, and in other respects improve their terms of service. 4. The allotment of a certain proportion of all vacant commissions, to be filled by the promotion of qualified non-commissioned officers at an early period of their service. 5. Appropriating to qualified and deserving non-commissioned officers and soldiers the whole of the appointments in the departments of the army below the superintending establishment of controllers and deputy-controllers. 6. Rendering a term of seven years' service in the regular army a means of obtaining employment in certain branches of the ordinary Civil Service. It would take too long to dilate upon these details, but if the principles he advocated were right something of this sort was inevitable. Going to another point, they had heard various objections to withdrawing the regular troops from the colonies, but, in truth, they were not wanted there. The colonies might be divided into three categories:—First, those which could take care of themselves, such as Australia and New Zealand, the Cape of Good Hope, and perhaps some others; next, those which, from the peculiar circumstances of the climate, and other reasons, were not worth the expense and risk of taking—such as the West India Islands and similar colonies; and, lastly, came one great colony which might, perhaps, be taken, and which certainly could not be efficiently defended by English troops—he referred to Canada. No doubt, if the United States thought fit to make an effort at all corresponding to that which was made by the Northern States during the civil war, Canada might for the time be over-run, and it would be useless to attempt defending it by a few thousand men. The way to defend Canada would be to attack the commerce of the United States all along the seaboard, and so produce an effect upon her whole system, from Boston to New Orleans. The most effective way of defending the colonies was to have the troops concentrated in a high state of efficiency at home, with a supply of fast steamers, such as had been constructed for furnishing the reliefs to the Indian army. Even for direct military action the troops would be more effective in this way than if scattered in small detachments all over the world. Then with regard to India. Under the East India Company there was a separate local European force for India, but in the great re-settlement after the mutiny it was determined that the European portion of the Indian army should be furnished by regular reliefs from the British army. The main grounds of this decision were, 1st, that the European regiments could not be maintained in an efficient state if they were entirely separate from this country; and, 2nd, that the existence of a purely local army would encourage a dangerous tendency towards premature independence. He might appeal to Mr. George Campbell if the spirit in which Anglo-Indians were working was not to educate the people of India for self-government and independence. To take the measures which tended most directly to that end was best both for India and for ourselves. If India were once placed on the road to attaining national greatness and independence on the European model, it would take no one could say how long for them

to arrive at the desired end, and during all that time England would be her natural protector, and it would be only at some indefinite period, when she had become one of the most powerful nations in the world, that England would have to withdraw. Anything that risked the success of this policy was to be deprecated, and one thing which would certainly have this effect would be the establishment of a local European army. Mr. Campbell and others might remember how this point was approached in what was called the white mutiny, and how immediately its influence was felt. Nothing had occurred to diminish the force of these considerations. On the contrary, the rapid growth of India in physical and intellectual power made it more than ever desirable that, for the sake of both countries, no real bond of union should be unnecessarily relaxed. To reverse this policy, and to return to the rejected plan of having a separate European army, was, therefore, practically impossible. It was, however, not at all the case that the Indian service was unpopular. On the contrary, there was a certain class of men by whom the Indian service was actually preferred, so that, with fair offers of pay and promotion, the ranks of a separate Indian army could be readily filled. If this were so, it followed that the connection of our army with India was favourable to recruiting. In India, as the popular feeling expresses it, the soldier was treated like a gentleman; he had servants to wait upon him, more liberal pay and rations, increased facilities of marriage, and, above all, so great a variety of civil situations were open to him, that if he qualified himself he had a certain prospect before him of rising to a higher social position. They would be always sure, therefore, of having an abundant number of volunteers for that part of the army stationed in India. It was customary when a regiment was about to return home to call for volunteers for the regiments that were to remain, and it was a well-known fact that on such occasions the number coming forward was so great that the difficulty was one of selection; sometimes half a regiment would volunteer; and on a late occasion at Chatham, when volunteers for India were asked for, an extraordinary number availed themselves of the opportunity. It was evident, therefore, that every object might be attained by working out the present Indian military system, with regimental *cadres* returning home perhaps at shorter periods than at present, say seven years instead of ten; so that the regiment touching its native soil might, Antæus-like, receive renewed vigour and strength for its duties. There would always be a certain class of soldiers who would wish to follow their profession to the end, and for them India would be a suitable field. The advantages of India as a field of instruction for our officers also could hardly be over-estimated. In concluding his remarks, he wished to touch upon the financial part of the question, and in so doing he would, for convenience sake, follow the order in which the subject was treated in the letter on military expenditure in the appendix to his pamphlet on "The British Army." Of course a true financial statement always included a great many things which at first sight appeared very remote from finance. The propositions with which he started, viz.—that they had before them the alternative of a standing army and a popular army, applied to the financial as well as every other part of the question. He would quote what he had written last autumn on this subject:—

"The 'Recruiting Staff' extends the ramifications through every part of the United Kingdom, and its operations are supported by three classes of premiums—bringing money to the crimp, levy-money to the sergeant, and bounty-money to the recruit. Having got the recruit, another scheme of premiums has been devised in order to keep him—a second bounty and free kit on re-enlistment, extra pay during the period of re-engagement, and a life pension after twenty-one years' service. The charge for soldiers' pensions alone in the present year is £1,218,200. Then there is a large establishment of 'Staff Officers



of Pensioners,' the object of which is to get such further work out of the old men as they are capable of, and to exercise a benevolent superintendence over them. Now let us consider how the change proposed to be made will affect the state of things which has been described. That change is to make the army so popular by reducing the term of service to seven years, and opening to the soldier not only the higher promotion of his own profession, and of the administrative departments connected with it, but also the wide field of subordinate civil employments, that instead of the Government touting through its agents in the lowest haunts of vice for the refuse of the people, men of character and education belonging to every class of our population will seek to be admitted into the army, and those will be rejected who are for any reason unfit. As the recruiting for every branch of the service will be conducted regimentally, the ranks of the infantry of the line being completed from the home or militia battalion of each regiment, and the men will apply to the Government as in the police and in private employment, instead of the Government applying to them, the entire recruiting staff, together with bringing money, levy money and bounty money may be discontinued. As the soldier will as a general rule, serve only for seven years, the second bounty, the extra pay during re-engagement and the life pension after 21 years' service will cease, except the pensions of the few non-commissioned officers who will be retained after seven years' service. As there will be no enrolled pensioners, and few pensioners of any kind, the establishment of staff officers for their superintendence will *ipso facto* cease.

"Our army is with difficulty held together by a penal system of extreme stringency, the penalties of which are specially directed against desertion, including the barbarous and everywhere else disused practice of indelibly marking the letters of shame. The sum provided in the estimate of this year for the 'Administration of Martial Law' is £88,713, besides the expense of building and upholding military prisons and barrack cells, and the loss of the services both of the offenders and of the officers and soldiers employed in their apprehension, custody, trial, and punishment, involving indefinite escort guard, and court of inquiry and court martial duty. As care will be taken not to admit men of bad character, and soldiers who are guilty of disgraceful conduct will be expelled from the ranks, that small percentage, answering to the roughs and dangerous classes of civil life, who do little or no duty, and occasion constant expense in maintaining them in prison and finding guards for them, will no longer exist in the army. The crime of desertion is the creation of our present system, for when the soldier has once been inveigled and cajoled into relinquishing his free agency, he is bound for a longer term than in countries where the conscription prevails. Under the new constitution of the army, the man seeking to be engaged will feel that he is asking a favour, and almost the only punishment will be dismissal from the service. Some other use will then have to be found for the military prisons; the establishments connected with them, including the Board of Inspectors, may be discharged; and (which will be the greatest saving of all) no deduction whatever will have to be made from the effective force of the army on account of men in prisons and barrack cells and men appointed to guard them, or on account of deserters and men employed in searching for and escorting them, to say nothing of the officers and men engaged on the numerous courts of inquiry and courts-martial arising out of this coercive system.

"But, although not capable of exact calculation, there is no cause of the excessive expense of our army to be compared with the intemperance and vice prevailing in it. It is these, and not bad climate and hard service, which fill our military hospitals and return upon our unions so many men broken in constitution and

character. The expense of enforcing the Contagious Diseases Act has increased from £28,000 to £40,000, and the hospital vote has risen from £275,589 in 1867-8, to £380,771 in 1868-9, being an increase of £105,182 in a single year. Our expense under these heads must go on increasing while we confine our treatment to the symptoms and do not attack the seat of the disease. Indeed, the case is much worse than this. The disease is actively promoted by us. Our recruiting is carried on in public-houses, without any inquiry being made into the character of the persons recruited, and the temptation to intoxication and every evil inducement is stimulated by the head-money given for each recruit to the crimp and the recruiting sergeant. In the same spirit a portion of the soldier's pay is issued as 'beer money,' and the officer has the 'Prince Regent's allowance for wine,' the object of which is 'that no officer should be so poor as not to be able to drink his pint of wine a day.' And how is the strongest instinct of human nature dealt with in our army? The men are kept with the colours for twenty-one long years, and in the absence of marriage, or of the hope of early marriage, such wide-spread debauchery prevails that it has become necessary to regulate it by law, involving almost a public sanction to it, in order to mitigate the injurious consequences to the health of the troops.

"It may seem over-sanguine to expect a total change in the moral state of the army, yet, as the actual circumstances have made it what it is, we may reasonably hope that altered circumstances will make it something very different. The immoralities of the recruiting system, through which our young men enter the army, and the example of the long-service men, under the influence of which they live, will both disappear. Instead of being the last resource of the reckless, the army will be a desirable profession to the most respectable and purpose-like of our youth, who, preferring the future to the present, aim at achieving an honourable social position and a happy domestic settlement. They will often be actually engaged to marry, and will constantly look forward to the time when they shall have earned the means of doing so. There will be no counteracting influence to prevent the young men of this class from setting the tone of the army. The only remaining old soldiers will be non-commissioned officers who have been permitted to re-enlist after the termination of their seven years' engagement on account of their good conduct and soldierlike qualities, and these will generally be married men; and instances will abound of self-denying exertion having obtained its reward by promotion to commissions or to appointments in the army administrative departments or the Civil Service. Every body connected with the army knows the value of 'a clean defaulters' book and a healthy man.' The greatest economy of all would be that we should have to pay for none but effective men: for, to whatever degree this was attained, we might diminish the number of our troops in the same proportion, not only without any diminution, but with a great increase of efficiency, because we should be saved to that extent from the embarrassing, neutralising effect of unhealthy and disorderly men. Such men are worse than useless, because, besides doing no work, they require other expensive establishments to look after them. Above all, our army would cease to be a sink of moral pollution, by the overflow of which our civil population is contaminated, and we should not long be obliged to have recourse to such lamentable expedients as the Contagious Diseases Prevention Act, which, while they diminish the physical suffering, deepen the moral taint, because they indirectly countenance vice, and destroy the last sense of shame at its open profession. The responsibilities of empire also have to be considered. Those only who have lived in heathen countries know what a scandal to our nation and to Christianity itself will be removed by a change in the principle of our military system. The natives of India ask whether the

*Gora log* (European soldiers) are of the same caste as the *sahib log* (European gentlemen); and seeing the exhibition our soldiers too often make of themselves in the grog-shops and houses of ill-fame in the bazaar, they wonder why, if this be the result of a Christian education, the missionaries take such pains to convert the Hindoos and Mahomedans to Christianity. To abstain from intoxicating liquors is a cardinal point of both those religions, and it is a disgraceful fact that the tendency of our influence has been to encourage excess in the use of them. We are not speaking now of money, but of money's worth; and surely it is worth something, even for the peace and duration of our Indian empire, so to constitute our military force that it may present the aspect of a Christian army to the population of many races, languages, and religions, whose welfare is dependent upon us.

"Our army is greatly over-officered. As the officers do not in general go through any preliminary professional training, the public has to maintain those who are learning their duty as well as those who are in the effective discharge of it. In the absence of any sufficient reserve of officers, either in the ranks, or in the militia, or in the military colleges, the regimental establishments of officers must be framed on a scale to meet the casualties of war, and to provide for any augmentation that may take place in the numbers of the men, as well as to carry on the regimental duties. But the two characteristic circumstances which make the officering of the British army so much more expensive than that of the Continental armies, are—first, that the men, being taken only from one class of society, and that the lowest, and being held to long terms of engagement without any professional prospects, require more looking after than the men of other armies; and, secondly, that as the officers purchase their pay and means of retirement (in this sense only is 'purchase' a 'self-supporting system of retirement') in the price of their commissions, and in reality serve for nothing, they cannot be expected to work as those who are paid the full value of their services. In fact, they do not do so, and they are allowed leave of absence far beyond the officers of any other army or any other branch of the British public service; and it will be found that the standard of work is lowest, and the excess in the number of officers greatest, in those portions of the army in which the price of commissions is highest.

"The excess of officers, however, is by no means confined to the regimental establishments. The necessity of compensating both those who have paid heavily for their commissions and those who have been passed over for want of the means of payment, has led to the introduction of "unattached" promotion, which is made at the discretion of the Commander-in-Chief and the Secretary of State, without reference to any fixed establishment, and is charged on the half-pay list. This is an anomalous and dangerous practice, because it eludes Parliamentary control, and can be carried on only by the misapplication of a fund, the object of which is to provide for reduced and invalided officers. In the French and other Continental armies the charge for half-pay is very small, and this was also the case in the army of the late East India Company. In our army the charge amounts in the present year to £331,500, although from April 1, 1862, to December 31, 1866, £311,599, realised through the Military Reserve Fund by the sale of commissions to officers of the line, was applied to the extinction of half-pay received by officers of the line, artillery, and engineers.

"The rate of promotion also mainly depends upon the proportion between the lower and higher ranks; and the cause of the prevailing slowness of promotion in the British army is our practice of crowding the lower ranks beyond the possibility of their being relieved by absorption in the higher within a reasonable period. The obvious hardship and injustice of this state of things occasions a constant pressure to increase the numbers in

the higher ranks beyond the real wants of the service, and to purchase the premature retirement of efficient officers expressly for the purpose of procuring more rapid promotion for the juniors. The reduction of the excessive number of junior officers, therefore, has a financial advantage far beyond the saving of the charge for the officers reduced. In no other way is it possible to return to the sound principle of fixing an establishment suited to the wants of the service, and of promoting only to vacancies on that establishment, the half-pay list being restored to its original object of providing for reduced and invalided officers. If my proposals are adopted the officers and men of the large and expensive Militia staff will be fully utilised, by incorporating them with the depot battalions of the composite line, militia, and volunteer regiments, instead of their being kept during the greater part of the year in enforced idleness. The cost of the permanent staff of the disembodied militia for 1867-8 was £269,150, besides £16,500 for non-effective allowances. The existing depot battalions and regimental depots will also merge in the depot battalions of the new composite regiments, the command being taken by the senior officer present, whether he belongs to the home or to the general service portion of the regiment. The anomalous establishment of inspecting officers of reserved forces will merge in the military staff of the generals commanding divisions, which should be strengthened to the necessary extent and completed by a due proportion of the administrative establishments under the controllers. On the other hand, there will be a large reduction of the costly military and civil staff in the colonies, and the military force itself stationed in the colonies will be reduced in accordance with their altered circumstances, and our increased power of holding our military force in a concentrated state at home ready for service in any part of the world where it may be required. Although the savings which have been indicated are such as would arise from a change of system, whatever the numbers might be, and would be entirely independent of those which would be obtained by a reduction of force, this change of system would greatly facilitate such a reduction by increasing the efficiency of the troops, and placing large trained reserves at the disposal of the Government.

"Lastly, there is a class of savings which, in one respect, is the most advantageous of all, because it combines economy with increased simplicity and facility of administration. Of this description is the consolidation, with the proposed higher rate of pay, of numerous miscellaneous allowances in money or kind, the issue of which in a separate form increases the complication, expense, and delay of military administration, without conferring any benefit on the officer; the discontinuance of all official connection with the army agents (the authorised brokers and stakeholders of the purchase system), who are paid £41,000 a-year for doing in duplicate what must, under any circumstances, be done in a more simple and direct manner by the public establishments; and the substitution of a net rate of soldier's pay for the stoppage system and the separate allowance for beer. The expediency of these changes has been demonstrated over and over again, and it has been shown that the overgrown, unmanageable character of the War-office establishment, and the complex, cumbrous, expensive nature of our detailed administration cannot be corrected until these changes have been made; but the *vis inertiae* of our official system, and the opposing forces of our mixed system of government have hitherto prevented their adoption. It is an additional recommendation of the larger measures now proposed that, if they are accepted, these important details must follow as a matter of course. The existing scheme for the remuneration of the officers (if that deserves to be called a scheme which is merely the fortuitous result of a number of isolated attempts to cobble an originally defective arrangement) must collapse on the abolition of purchase, and the grant of a reasonable rate of pay; and the soldiers' stoppage and beer-money

could not stand after the admission of the educated classes to the ranks by the reduction of the term of service and the opening of military and civil promotion to the soldier.

"The new advantages proposed to be conferred upon the soldier are merely the removal of restrictions which bind him to the colours for an inordinate period, and prevent him from having an open career in the public service. They will not, therefore, occasion any new expense, and the important savings which it has been shown must arise from them will be obtained without deduction. As regards the officer this will not be so. There will be considerable savings in this case also, but they will not be obtained without some outlay. An indispensable preliminary condition of all improvement in our army is the abolition of the purchase system, because, without this, promotion would be anything but a benefit to the soldier, and any new advantages conferred upon the existing officers would merely aggravate the burden upon their successors, who, according to the unfailing laws of demand and supply, would have to pay so much more for their commissions; and when, at last, the necessity for abolishing purchase came to be acknowledged, the charge upon the public for compensation would be increased in the same proportion. I have shown in my first pamphlet and in the third chapter of the second, that the popular estimate of the compensation that would have to be paid is greatly exaggerated; but, whatever the amount may be, it will be the price of an organic reform rendered necessary by the neglect of past generations, and intended for the benefit of the generations to come; and it should, therefore, like the expense of the fortifications and of the reconstruction of the law-courts and public offices, be charged to the capital account of the nation, and the repayment of it should be spread over a considerable period. The other new charges would be an increase to the pay of the officers—enough, but not more than enough, to enable them to live by their profession—and the grant of retired allowances after not less than twenty-five years' service. The cost in this case also has been over-estimated in popular opinion. It is commonly assumed that the existing number of officers would be maintained, and that the great majority of them would retire on pensions; whereas the number of officers would really be greatly diminished, and the majority of this diminished number would either retire before they became entitled to pensions, or would remain in the army after they became entitled, in order to obtain the higher professional rewards. Pensions would only be applicable to a certain limited class of officers who, after having passed twenty-five years in the service, determine not to continue in it.

"To sum up, the main cause of the excessive expense of the men is that we require from them long terms of service, and shut them out from all promotion, military or civil, so that we have to pay at an extravagant rate for recruiting them, for preventing them from deserting, for keeping them in health, and for pensioning them when they are worn out; and, after all, we have to maintain an undue proportion of non-effective men, who, although they do little or no work, are the most expensive of all. The main cause of the excessive expense of the officers is that they are maintained in numbers greatly beyond the wants of the service, which arises from the fact that, owing to the purchase system, they neither have, nor can have, any real remuneration, and it is therefore impossible to enforce either a proper previous training or a proper standard of work; and, in order to compensate the officers in some degree for their insufficient remuneration, an inordinate effective establishment has been supplemented by a still less justifiable unattached and non-effective list. The two keys of the reform of the army are, therefore, the reduction of the soldier's service, and the abolition of purchase. What the ulterior pecuniary result would be if these two changes were properly worked out through all the necessary subsidiary measures I will not undertake to say, but it would certainly lead to a large reduction of

expenditure. It is also certain that both the force for home service and the force for general service would be more effective than at present, and that, instead of being a prolific cause of demoralisation, the army would become a national training school of the highest value for all classes of our population."

In conclusion, Sir Charles Trevelyan said he was of opinion that with such a system as he had attempted to describe, the army expenditure might be easily reduced to ten millions a year, and this would leave five millions for the general service of the country, and as this seemed the place where each man was come to forage for his own particular hobby—all of them were interested in general education, their respected Chairman in technical and industrial instruction, and Mr. Cole in completing the Kensington Museum—so he also might be allowed to trot out his little Shetland, viz., the concentration of our public offices, and the embellishment of the Thames Embankment.

Mr. BOTLY thought they were very much indebted to Mr. Cole for having brought before the Society, and through them before the public, a matter of so much importance, as to which they seemed to have been asleep for a long time, but which history told them was a matter which had always been objected to, viz., the existence of a standing army. At the time of the Commonwealth, and even previously, a standing army was always much objected to. During the reign of Charles II., it was stated by Rapin, in his history, that the army which had held England in awe for so long was reduced to a single regiment; but the King introduced a novelty, which was disagreeable to many at the time, when he formed a guard of two regiments, one of horse and one of foot, and it was immediately apprehended that he had a design on the liberties of the people. The opinion of the late Lord Herbert was quoted in Mr. Cole's paper. Some years ago he (Mr. Botly) had a conversation on this subject with that lamented nobleman, who then stated that he was not in favour of an army in time of peace being at all large, but of having an effective nucleus, such as could be easily increased in time of need, so that his view coincided very much with that put forward in the paper. They must all agree with the complimentary remarks that had been made on the first engineer officer who had been entrusted with the supreme command. And with reference to the readiness with which soldiers who had spent a short time in the army returned to civil occupations, he might point to the case of Switzerland, whose inhabitants were well known to turn with the greatest facility to agricultural and other peaceful avocations, even including watchmaking, and it was found that their military training had a very beneficial influence upon them. If, by the plan proposed, seven millions could be saved annually, who could calculate the prodigious effect that would be produced on the industry, commerce, and agriculture of England? It was beyond calculation what might have been the prosperity of this country at the present time if the hundreds of millions which had been spent in war had been employed in productive industry. Another point was the morality and general character of the soldiers, but in addition to that he would add that a great demoralisation of the community at large was always observed in the neighbourhood of large camps or military stations. Sir Charles Trevelyan had mentioned the enormous cost of our army as compared with that of other countries, and had very justly observed that, on that ground alone, the argument against standing armies was decisive. It had been doubted by some speakers whether civilians were in a position to discuss this subject at all, but it was a well-known fact that the greatest inventions of modern times, in various branches of life, had emanated from persons trained up in totally different occupations; for instance, the projectors of the Eddystone Lighthouse were men brought up as mercers; and the greatest work on nautical tactics

was written by an attorney of Edinburgh. In conclusion, he hoped they would have many more papers as interesting as the one they had been discussing, which he had reason to believe had been very favourably received by City men, and would, no doubt, have an influence wider than they at first sight might be disposed to imagine.

Lieut.-Col. HEWITT, R.E., said he would endeavour to confine his remarks to practical points, because it had been his lot to have considerable opportunities of seeing the working of the English army under various circumstances. The impression produced upon his mind was that we ought to be very cautious in making any great alteration in the system of the army. He did not believe that military men were at all opposed to reform, but they were desirous of seeing it carefully undertaken. In the first place, he would remark that the paper started on the basis of the estimates for the year now expiring, which amounted to about 15 millions, but the actual figures upon which the discussion ought to be based would be nearer 12 millions, because, in the first place, there was a considerable drawback from those estimates, and they also included the non-effectives, with regard to which there could not be much alteration made, at any rate for a long period, even if a change were immediately made in the constitution of the army. By the estimates for the present year he saw that there was a further reduction of about half a million, which would bring the sum total to about 11½ millions, which certainly was not very largely in excess of the estimate given in the paper. In discussing this question there was one matter which, as an engineer, he should say was the "key of the position," and that was the force which was necessary to be kept up in India and the colonies. According to our system, in furnishing a garrison to India, we had to ship every year five regiments of infantry, a regiment of cavalry, and a certain proportion of artillery to that country; and, if a constant relief for these troops were to be maintained, it was necessary to keep up a certain strength of the standing army at home. Whether we could alter that system of relieving the foreign troops was a very wide question, which he would not then enter upon; but he must point out that the strength of the regular army in this country must be dependent on the numbers which were required to be sent to India. It was said that we could remove the troops from some of the colonies, but their presence there was required for the sake of trade and commerce in some cases, and in others from the interests of diplomatic action. For instance, in the China seas we must keep up such a force as the Foreign Office required; and in the West Indies, where there was a small European population in the midst of a large number of blacks, who might rise at any time in insurrection, as they did in Jamaica, it was necessary to keep European troops. Again, in the Mauritius, there was a small English force in the midst of a French population, and with a French island close at hand, where a number of hostile forces could very readily be increased directly they knew there was any likelihood of the English forces being diminished. The question had been mooted as to the employment of soldiers on public works or in private capacities; but they were even now very much employed in reaping and haymaking, and he was sure the soldiers were all the better for it. Not long since a contract was going on, under his own direction, at the Tower of London. A contractor, stating that he had some difficulty in providing a sufficient strength of labour to complete the work within the specified time, asked him if he could have the assistance of some soldiers. He at once obtained the consent of the general officer, and the men were immediately set to work. In public works under Government, the engineer department, with which he was connected, were very largely employed. He had had those under his command so engaged in Gibraltar, in Ireland, at Shorncliffe, and other places, and there were many instances in which work was found for the men to

do in ordinary regiments. However, there were but a very small proportion who had ever learned any trade before they entered the ranks, and this would, of course, prevent their profitable employment. In the case of the Engineers, however, in consequence of their having better pay, and a variety of situations being open to them at the close of their period of service, they were enabled to enlist a superior class of men, who were thus available for employment in various capacities. He was glad to say that Mr. Cole had opened at the South Kensington Museum a number of appointments for deserving non-commissioned officers from the Royal Engineers. The same thing had lately been done in France, where a number of subordinate appointments, not connected with the military service, had been thrown open to men who had been in the army, and he should like to see a similar system introduced in England. It would not only be an inducement to good conduct amongst the men themselves, but when these men were seen going about filling these situations it would be a great inducement to young men of good character to enlist. Mr. Cole had pointed out that the question was mainly between having a large highly paid army and conscription. Of course officers had nothing to say against the conscription, because it would supply them with a superior class of men to deal with; but he doubted whether this country would for a long while to come be educated up to the point of submitting to the conscription. He was not one of those who were accustomed to cry down English troops in comparison with those of foreign nations, which was sometimes done a great deal too much, and he might mention that when he was in Algeria one of the leading generals there, who held high command, asked him what he came there to learn, for having been encamped by the side of English troops in the Crimea, he could say that they were far beyond the French. To the same effect was the opinion of a Russian officer, who was here on a diplomatic mission last year, and who told him that he was perfectly astonished at what had been done in the way of improvement in the English army during the last six years. Allusion had been made to the Army Works Corps, and he might therefore say what he knew about them. When they were engaged in the Crimea they read in newspapers a great deal about this Army Works Corps, which was coming out to make the trenches and so on, and considerable amusement was sometimes caused at the remarks which were made, but when the men came out, and they were highly paid for their services, it turned out that there was one omission in the contract, which was rather an important one, and that was that although they came out to take part in military operations, there was no provision that they were to go under fire. They undertook to make a road, and they made it, with the assistance of thousands of soldiers, and a large number of officers there to superintend them, but the sappers were not relieved from their work in the trenches as some of them had been led to expect. The men of the Army Works Corps worked very well; but on one day, the 9th of September, when there was a little firing going on, he did not see much of them. The effect upon the sappers and miners when they saw this corps of highly paid men come out from England was to put them upon their mettle, and induce them to use every exertion to do the work better than those who were sent out to assist them. He hoped that on any future occasion the force of engineers would be kept up, and if any increased number of men were required, they might be enlisted perhaps for the war only, but at any rate they should be enlisted as soldiers, and be required to undertake whatever duty they were called upon to fulfil.

Mr. GEO. CRUKSHANK said an allusion had been made by a military officer to drinking in the army as being one great cause of expense, and in corroboration of this statement he might mention that many years ago, when the question of the health of barracks was brought forward, he attended at the Horse Guards to explain his

system of ventilation. The reply he received was that no doubt his suggestions were very good, but that drinking was the great curse of the army. This might seem to come from him with less force than from others, he being a teetotaler; but, unfortunately, it was too true. It had been truly said that if our army were all teetotalers, it would be the most powerful in the world; and with regard to the character of the army, he maintained that there was no better conducted man in society than a sober, well trained soldier. Some allusion had been made to our men not being well prepared at the commencement of the Crimean War, but on that point he begged leave to differ. He believed that the men were all thoroughly prepared for the field, but there was a great deal of mismanagement in higher quarters, which was the cause of the great sufferings to which our army was subjected. He knew it to be a fact that a mercantile captain gave information as to the best point for landing the troops at Balaklava, and, although his advice was not taken, he believed no troops in the world could have better met the preparations which had been made for them by the Russians at Sebastopol than the English did, but if they had landed at a proper place they might perhaps have gained their object in a few days. With regard to the Guards and the Irish constabulary, he must say that they were two distinct classes. The Guards were as perfect in their evolutions as possible—more like machines than human beings—and that perfection in drill, every military man knew, was of great importance in the field. One other point of great importance which had been alluded to several times was, the education of the young in military duties. He learned his exercise when he was 10 years old, nearly 67 years ago, at a time when fears were entertained of a French Invasion, and at the age of 16 or 17 he joined a rifle corps, when he found he did not want any drilling, having already learnt it, therefore he would say that if an Act were passed making it compulsory that every boy should be taught his exercise, there would be no fear of an invasion, for any possible enemy of England would have this consideration, that there were millions of men ready to turn out at a moment's notice if they were wanted. First of all, therefore, before making any changes in the present system, he would recommend that all boys should be drilled. For eight years he had had the honour of commanding a battalion of volunteers, and one great point with him was to have a good body of cadets. Attached to the company which he had lately commanded there was a body of 80 cadets, who always fell in when the company were drilled, and they went through their exercises as well as any of the men, and sometimes better. If this plan were adopted of imparting a knowledge of military exercise to all the youths in the country, the only thing necessary besides would be to have arms ready for them in case of need. He disagreed with Mr. Cole as to a reduction in the standing army, for he believed it was important to keep it up to at least its present position, and then with a good reserve in militia and volunteers he had no fear of any emergency. From his experience with the volunteers, he quite agreed with Lord Elcho that the capitation grant should be increased. If it were only 10s. extra per man it would be a great service. He had witnessed the evolutions of the volunteers at Brighton with a military man by his side, who remarked to him that after what he had seen that day he was sure there was no fear of an invasion, and in this opinion he most cordially agreed.

Admiral Sir GEO. SARTORIUS said it might appear strange for a naval officer to be speaking on a subject of this nature, but he believed the two professions were so nearly connected, that what related to one in a great measure also related to the other. There were certain points which seemed not to be taken notice of either by Mr. Cole or by many of the speakers, viz., the great change which had been introduced by steam in navigation, the insular position of England, the great develop-

ment in artillery, and particularly the great perfection in precision and extended range which had been attained in small arms. All these considerations together made it absolutely impossible, if we used the means at our command, that we could ever be invaded. He believed England was safer at the present moment by far than ever she had been; civil discord alone, and no combination of foreign nations, could ever place England in danger. But it must also be remembered that with regard to political position, we held the first rank amongst the nations of the world, and had certain duties to perform; and therefore, although we had no necessity for a standing army to repel a foreign invasion, we ought to have such a force, say 60,000 or 80,000 English troops, as would enable us to turn the scale in favour of our own views and interests in the case of any foreign complication. It had been considered by some what we could do in case of an invading army, 50,000 men or so, being landed on the English coast; but he did not believe such a thing was possible, and if it were, there would be no difficulty in disposing of them with the aid of our militia and volunteers.

Sir ALEXANDER MALET, Bart., K.C.B., said he was anxious to make a very few remarks on what fell from Sir Charles Trevelyan with regard to the English colonies. Having been engaged for the last 42 years in the diplomatic service, he had had some opportunity of hearing the opinion of foreigners upon different matters which bystanders often saw more of than those actually engaged. A small paragraph appeared the other day in a paper, which perhaps not many persons read, to the effect that an agent from the Transvaal Republic had appeared at Berlin, and though the object was not exactly known, it was supposed that it might be to enter into some negotiation with the Prussian Government to transfer that seceding colony of Great Britain to Prussia. It might not perhaps be quite susceptible of absolute proof, but Prussia, perhaps more than any other continental nation, was of opinion with the first Napoleon that it was necessary for a state to have "ships, colonies, and commerce." They knew that Prussia desired possession of Holland, but that was probably not so much for the accession of power which she would thus gain in Europe as because with Holland was connected the colony of Java, which England had so foolishly, in his opinion, ceded to the Dutch. From Java he passed naturally to the subject of India. Sir Charles Trevelyan had said that we were educating our Indian subjects to be their own masters. All he could say was that he hoped it would be a very long while before that time would arrive. The value of India to England was immense, especially in the opinion of foreigners, and it could not be doubted that the possession of that vast country, for which Englishmen had spent so much blood and had struggled so manfully against the most dangerous insurrection in modern days, was a matter which it was impossible to overvalue. India had been the safety-valve which had taken off what would perhaps otherwise have been a "dangerous class" of highly educated gentlemen, for what would there have been for them to do but for the vast field which India held out to such men? He believed that the maintenance of our dominion there was of so much importance that it ought to be held paramount to all other considerations, and as it was impossible to hold India without a constant army, one should be kept up if solely for that purpose. He had no doubt that for the defence of England herself the volunteers and militia would be amply sufficient.

Capt. WAKE, R.N., said that the remarks which he had intended to make had most, if not all, of them been much better said by Sir Charles Trevelyan. He was quite certain that a very good knowledge of drill and military exercises might be readily acquired at school. It would save a great deal of time afterwards, and it also added to the efficiency of the individual in whatever position of life he afterwards occupied. His great point, however, was that every man in the country should have

an appointed station to which he might go in the case of emergency. He might mention, as an illustration, that on one occasion H.M.S. *Bombay* was very nearly on fire, and the only thing that saved her was the arrangement which had been previously made, that every man knew exactly his station to run to in case such an accident occurred. That was exactly what he wanted to see in England, so that every man in the country, not only roughs and the lower classes, but every man, from the Prince of Wales to the dustman, should have his allotted station under an officer appointed to take command. The only way to enjoy peace was to be prepared for war, and everyone seemed to agree that we were coming upon perilous times. It was very difficult to get anything done in England, there were so many different opinions; and if a foreign invasion took place within the next few months, it would be a considerable time before anything could be done to meet it, because everyone would be disputing as to what was the best plan to adopt. It was, therefore, of the greatest importance that these questions should be discussed when there was time to settle them without danger. The victory of the *Shannon* over the *Chesapeake* had often been referred to with pride by Englishmen, and was sometimes supposed to have been accomplished because the English were so much better men than the Yankees, but the fact was the victory was gained simply because the Englishmen were trained and knew what they had to do; each had his post, and remained there till called upon to board the enemy. There was no hesitation; it was done at once, and the whole thing was over in fifteen minutes. He believed the time was coming when every man would have to stand by and guard his own property, and, therefore, he was very anxious that these precautionary measures should be taken as early as possible.

Mr. GEO. CAMPBELL (Chief Commissioner of the Central Provinces of India) said he did not feel competent to discuss the general question, but might be allowed, perhaps, to say a few words on the special view of it raised by Sir Charles Trevelyan, although it had not been touched by others, and he believed it was desired to exclude India altogether from consideration. It would be all very well to do so if possible, but it struck him that it would be very much like inviting one of the Siamese twins to dinner and forgetting the other. Looking at the matter merely from a British point of view he was very favourably impressed with Mr. Cole's idea, and if not he should have been convinced by the arguments which he had heard. He quite believed that for defensive purposes a popular and economical army was the right thing. No doubt there was a good deal in the argument that in many cases it was cheaper to employ a man to do certain things for you than to do them yourself, as in the case of a policeman; but it was not the case always. For instance, no one could pretend that it would be better and cheaper for a farmer occupying an outlying position in New Zealand to pay a soldier to march up and down in front of his property, perhaps for years together, without being of any practical service, rather than to arm himself, his sons, and servants, so as to be prepared to repel any attack which might be made upon him. The same thing, he believed, applied to the defence of a country like England. It had been suggested that the habitual use of arms was inconsistent with the genius of the English nation; but he could not agree in this view, for he believed the English, and especially the Scotch, were more nearly allied to the Prussians than to any other European nation, and they had brought this system of a popular army to the greatest possible perfection. There was no doubt, also, that it was a great advantage to the population to be trained in military exercises; he had been much struck with this on a recent visit to Scotland, when he saw the militia called out, and finding that the majority of them were miners, he could not but be struck with the great benefit which must be derived by men who passed the greater part of their

time in the bowels of the earth from being called out for a few weeks in the summer for out-door exercise. The only doubt was whether the few weeks during which the militia were under training was sufficient to make them into thorough soldiers, ready for service at a moment's notice; he had not the least doubt that, with six months' training, either the Militia or Volunteers would be able to meet any army in the world. The expenditure on the army was no doubt very large, but it was said, on the other hand, that the estimates ought really to be taken at twelve millions, and that it was better to let well alone. That might be true if we were thoroughly satisfied that at present it *was* well; but very grave doubts existed on this point; and it was very evident that we were not at all in a position to meet any of the great continental armies. It was, however, quite impossible to treat this question apart from India and the colonies, and as long as the present system was continued it was absolutely necessary to maintain a standing army. A national army would do very well if there were no colonies, but happily we had them all over the world. This was not the case with the other European nations. In the case of France, Algeria might be considered as their Aldershot, and, with the exception of that colony, French soldiers were not liable to serve abroad. Their other colonies, such as they were, were garrisoned by a distinct class of men called "marines," who, in fact, answered exactly to the ordinary rank and file of the English army. His own opinion was, that many of the colonies might be left to themselves, and others might be garrisoned by men on the same footing as the French marines, but India stood apart and distinct from all the rest. He had heard a great many hard things said of Anglo-Indians, but never before to-day that they belonged to the "dangerous classes" of society, who were better out of the way. As to its being our duty to prepare the people of India for independence, he would not express any decided opinion, but, taking a practical view of the point, he was quite positive that this would not be accomplished in the present generation, the next, or the one following; and therefore, for the present, it might be left out of consideration. As to the value of India to the mother country, he might not perhaps take quite so sanguine a view as some people, but the amount of English money invested in India, in various ways, could not be much less than 200 millions, and therefore, whatever view they took of its abstract value, it was plain that Englishmen would not lightly abandon it. There was an enormous population there, who were not difficult to govern if arms were kept out of their hands, but their numbers were so great that it had been said that if each native were to throw one clod of earth, every European in the country would be overwhelmed. It was, therefore, evident that however orderly or well-disposed they might be, it was necessary to keep a large European army always there, and not only that, but also a native army in addition. The European army, of course, was required to keep the native army in check, and it had been found in former days that there were great difficulties in the way of keeping up a local European army as in the time of the East India Company. The difficulty was who were to guard the guardians, for there were peculiar circumstances which rendered a mutiny much more probable in India than elsewhere. The Government was despotic with regard to the natives, but in the case of Europeans there was the greatest liberty and even license. The European army was under popular influence to an extent unknown in any other country in the world. If a private soldier thought he was hardly treated by his officer, he immediately wrote a letter to the newspapers, which was read by every soldier in the barracks next morning. There was one paper published in Calcutta which circulated almost exclusively amongst the soldiers, the license of which would hardly be believed. The consequence was that it would not be safe to trust the defence of



India to any local force. Sir Charles Trevelyan had suggested that the difficulty might be got over by something in the nature of a volunteer force for service in India, but the objection to that would be that if this were carried out, and the men were allowed to re-volunteer when their term had expired, it would come at length to something very much like a local army under another name. He was not, however, prepared to give an off-hand opinion upon this point. He looked upon it as a matter of vast importance to establish a national army on the plan suggested by Captain Wake, telling off every man to his station, but he did not think the question of a standing army or a national army could be decided until we had settled exactly what to do about India. Having disposed of that, he did not think we should have much difficulty in doing what was proposed by Mr. Cole, or something very similar.

Mr. EDWIN CHADWICK, C.B., said he had to bring forward in support of the question a reserve force of what now was in reality a popular force, that might be an efficient part of a defensive army—a force of picked men of the highest military quality we had ever had on battle field, which might be brought up to thirty-eight thousand men, namely, twenty-seven thousand for England, Scotland, and Wales, and eleven thousand for Ireland. He meant, of course, the police. As a commissioner of inquiry for the establishment of a general police force for this country, he could speak confidently of the quality of the force available—that the ranks would be as if it were composed of non-commissioned officers. A commissioned officer, who had been in war, and who, as high constable of a country force, well knew the material of which it was composed, had declared to him confidently that with it he could roll over an equivalent number of the militia force or of the regulars. It was remarkable how low the capacity of organisation was in this country, and in Parliament, where there were military men who should know better, who allowed this force to continue disorganised—even into companies as it were—under independent commands, which could be overwhelmed by mobs of larger numbers hastily gathered together, and allowed cities to be left at their mercy. Thus in Lancashire there was a police-force of three thousand men, for defence against internal enemies, split up under separate independent commands, of which the largest was of some seven hundred men at Liverpool, and some six hundred at Manchester. As each might separately be overcome by a mob, it was a necessity that a military force should be kept in barracks in the county, and it was kept there in military routine from year to year, to meet the extraordinary emergency of a mob rising, and to maintain the freedom of election and the liberty of the people against them at dissolutions of Parliament; whilst if the police-force were properly organised, the three thousand men in the county could be concentrated in sufficient force for such occasions—and as against yet more extraordinary occasions sufficient contingents might be concentrated from an aggregate of twenty-seven thousand police for Great Britain. The superiority of a police-force over a military force, as against internal enemies, had been displayed in Ireland. The superiority of such a force for defensive warfare against external enemies, admitted of demonstration. In this respect it admitted of considerable improvement, without detriment to its ordinary crime-preventive, or crime-repressive, or order-maintaining service. The mounted part of a police would, with improvements, constitute a superior cavalry. It was part of their (the Commissioners') principle of the organisation of a police, that it should be organised for beneficent service, against domestic calamities, fires, and accidents—that the police should have in charge fire-engines, and they had now stretchers, and were accustomed to aid the wounded by police surgeons. The police might well have charge, in cities and proper stations, of Whitworth's greatest artillery (his least and lightest), his two or three-pounders, which were of longer range than the heaviest of the

old field guns, and of more varied and efficient application. A general organised police for military purposes would be superior, in principle and action, as a defensive force, to any army ever seen in battle field, in our own or on any other ground, in old or in our own times—and that force, in the United Kingdom, he undertook to say might be got for nothing; that was to say, within the direct local rates and expenses, and the existing civil expenditure—in great part wasted—for the ineffective repression of crime. The organisation of the scattered police forces and their mobilisation for systematic purposes were indeed needed, for the efficiency and economy of their every-day civil services, against the armies of depredators and delinquents at large and for preventive action against crime. That most expensive and wasteful class of administrators, the unpaid vestrymen of the metropolis, had objected to the policemen being occupied in sword exercises and military drill. Why, sword exercise was baton exercise, and the military training doubled the efficiency of the police for their individual defence against roughs and thieves, and was a necessary means of the economy of the requisite force. A police force might, however, be highly military in its organisation, and less military in its civil action. It was a defect of the Irish police force, that it was too military in its civil action. These ignorant vestrymen and their representatives would subject the public to the expense of double inferior forces, military as well as civil, and maintain by their mutual inefficiency a third army, that of depredators at large, spoiling the ill-defended; and for the repression of civil riots would maintain an inferior and unconstitutional army, repressing by the indiscriminate cutlass, instead of the constitutional baton, or the prehensile hand of the police constable. This was a great topic of administrative economy. The need of the maintenance of a standing army was advocated for our colonies. But we should instruct ourselves, and we should instruct them to get up and maintain for themselves such a popular force as he had described, for every day use, as well as for superior defence. We should also be instructed to drill all our children for the augmentation of our productive power, as also for defence against internal as well as external enemies. The evidence he had collected, and the conclusions he had put forth in respect to the drill in the school stage, were being acted upon in some of the Canadian States, who had voted money for the purpose, and they were also being acted on in Massachusetts and the New England States; and they ought to be advised to attend to them in our colonies. This was a topic for development. It was lamentable to hear it maintained, as had been done by Admiral Sartorius, that we should be at the expense of keeping up such a standing army as fifty thousand men to throw it in to turn the balance on one side or another in continental quarrels. An example of this doctrine might have been presented on the occasion of the war between Prussia and Denmark, when there was a large party who were so minded and would have had us thrown our military weight—such weight! with such expenditure—on the side of the Danes. If we had done so our whole standing army, our thirty or fifty thousand men, maintained from year to year at the expense of so many millions, would certainly have been mowed down by the repeating rifles as the Danes were, and would have been all miserably gobbled up, to our disgrace before the world; whilst with the larger popular army contemplated, presuming the war to be popular, a greater force could be sent, and great reserves would have been available. The question now was really between a small and expensive standing army, of inferior and dangerous quality, and a large popular army, of superior morale and quality, at greatly reduced expense.

Major-Gen. Sir WM. DENISON said he appeared rather as the advocate, summing up the evidence for the defendant, because, having belonged to the army for three or four and forty years, he felt himself identified

with it, and he must say he thought they had been rather hardly dealt with. They had been abused, and told that the term "old soldier" was synonymous with blackguard; but he contended that this was an entire mistake. There were in the army, as in every other trade, calling, or profession, both good and bad, but he maintained that the drill and discipline of the army had very often the effect of converting a rough and blackguard into a decent man. And this was shown to be true from the fact that discharged soldiers were constantly employed in clubs, public institutions, and elsewhere as messengers, and in various situations of trust. It was plain, therefore, that the army was not formed of the scum of the earth, or, if so, it was refined and purified. What he wished to do, which every one else had left undone, was to go a little into arithmetic on this matter. Several statements had been made about the cost of the national army, Mr. Cole undertaking to supply it for £7,000,000, while Sir Chas. Trevelyan mentioned £10,000,000, but no one had gone into any detailed estimate of how it was to be done. A difference of opinion had also been expressed as to whether the present expenditure should be taken at 12 or 15 millions; but, taking it at the latter amount, it must be remembered that for that they had a regular army and militia of about 250,000 men, and 150,000 volunteers, making together 400,000 men available for service, though of course a large number were scattered about in different parts of the world. In place of this there were two propositions before the meeting, Mr. Cole's and Sir Chas. Trevelyan's, which latter was quite different, being entirely voluntary, while Mr. Cole's plan of requiring one man in every thirteen to be enrolled was very much like conscription. Sir Charles Trevelyan's idea was that the army would be such a nice institution, formed of incipient angels, that everyone would be struggling to enter it; this was all very pretty to talk about, but practically no army would be at all the sort of thing that young angels would be anxious to have much to do with. However, Mr. Cole's was the scheme which they were invited to discuss, and to that he should confine his attention. The proposition was that one-thirteenth of the population were to be drilled for a year, which it was assumed would be sufficient to make perfect soldiers of them, and then they were to be called out for training every year for twenty days. Objections had been made with regard to this plan in the case of India and the colonies, and they were got rid of by saying that India was to pay for itself, and the colonies were not to be defended.

Mr. COLE said the colonies were to be defended.

Sir W. DENISON said that Sir Charles Trevelyan, in his classification, had entirely omitted garrisons, such as Gibraltar, Malta, Bermuda, and so on.

Sir CHARLES TREVELYAN said he included Gibraltar and Malta under the head of India, being on the route thither.

Sir Wm. DENISON said it could hardly be expected that Gibraltar should support itself as it was proposed that India should. Taking the case of India, we required there 65,000 or 70,000 men, and they required to be constantly relieved. There was great mortality, mainly owing to the climate being unsuited to the white man, so that about 2,000 died every year, and about 2,000 more came home invalided; so that there was a constant supply of four or five thousand men annually required in addition to the periodical reliefs, for which purpose five regiments went out every year. These could not be taken from Mr. Cole's 16,000 men. If he understood Mr. Cole's plan, he intended to trust to Providence and fast steamers, leaving only a few officers, artillery, engineers, and so on, in places like Gibraltar and Malta, supplementing them by a stronger force as soon as possible in case of need. But even on this supposition we must have the troops ready to send out at a moment's notice. It had been said that in future we should have information through the newspapers of what was going to happen. He could not say that he had so much faith.

We learned from the newspapers all that had happened, and sometimes a great deal that had not, but he did not believe in the provision of newspaper editors as to what was about to take place. What would be the use of a brigade of artillery and a company or two of sappers in a place like Gibraltar, which mounted 800 guns, and had an enormous extent of parapets to be lined? If we left it in that sort of way, the surrounding population, being many of them smugglers and accustomed more or less to the use of arms, would be only too glad, on finding the doors unsecured from motives of economy, to walk in and take possession. At the very least, 5,000 men were required for each of these places, simply as a peace garrison. Then there were garrisons required at Bermuda, Antigua, Mauritius, and other places, and these troops must be relieved at stated intervals, and, fast as the steamers were, they took three months to reach India. With regard to the colonies. It was unfair, as he had formerly observed, to tell them to look after and defend themselves, and, at the same time, give them no voice in the question, whether or not war should be declared. It would be a beggarly policy to act in such a way from supposed motives of economy. There was no analogy between a colony like Australia and an English county, because in the latter case, if there were any talk of hostilities, there would be such a noise made in Parliament as would soon put a stop to it, unless there were very good reasons indeed. He would not say anything about Sir Charles Trevelyan's beautiful notion of training up the people of India to govern themselves; but in 1861, his (Sir W. Denison's) reply to Sir Bartle Frere, in Calcutta, on the same subject, was, that if they did so, the natives would turn round the next morning and kick them all out, and most deservedly so. In the first place he did not believe in their capacity for self-government, but if it were possible it would be the most suicidal policy in the world. The Indian was the same now as he was in Abraham's time; at any rate we had been there for the last hundred and sixty years, and had produced no change. The Hindoo was a coward and a liar, the most abject slave to those in authority over him, and the most cruel tyrant to whoever was in his power; in fact, these two qualities always went together. But now to the point of the economy of the system proposed by Mr. Cole. One thirteenth of the population were to be trained for a year, which might in round numbers be taken at two millions. They could not be paid less than one shilling a day, and with the other necessary expenses he should be putting the cost at a very low figure indeed at £25 a-year per man; there was £50,000,000 to begin with, and it would, in all probability, be much nearer £100,000,000. That did not look much like economy, and this included nothing for officers, barracks, clothing, hospitals, &c., which would certainly bring the sum required up to the hundred millions. Where was that to come from? But supposing that were provided for, borrowed, perhaps, then came the annual expense of training the men twenty days, and the cost of training the additional 25,000 men each year, which would be about one-thirteenth of the annual increase of the population. If the soldier's lot was to be made so remarkably pleasant, they could not pay him when called out for drill less than he earned on an average, and the lowest sum which could be named, therefore, was half-a-crown a-day; but putting it even at one shilling a-day, it would amount to two millions, which was a tolerable amount to begin with. True, it might be said that the manufacturer or employer would save the wages during these 20 days, but on the other hand he would lose the profit which he expected to get from it, even supposing such an amount of labour could be spared. But he should like to ask the Chairman, or any great manufacturer, how he would like to have all his hands taken away, and his machinery stopped, for 20 days in the year. It came, in fact, to this, that 48 millions of days' work would be abstracted from



the productive industry of the country each year, besides the yearly increase in proportion to the growth of the population. It was quite sufficient to go into the matter fairly in this way to dispose of it altogether. It was all very well to make a general estimate and say so much for this, and so much for that, and it made seven millions altogether, but if the thing were gone into in detail, the scheme would be seen to be as much a delusion economically, as it would be, in his opinion, practically. Mr. Spencer Walpole had very truly observed that it was much cheaper for a man earning 6s. or 7s. a-day to hire a substitute than to do his own soldiering, and, generally speaking, it was much better for the public service to hire a man permanently, who could be kept under strict discipline if required, than to take the ploughmen and artisans of the country and make them into soldiers. He did not believe, with their present standing army, militia, and volunteers, that there was the least occasion for alarm on any ground whatever, and he must say that when he heard in a foreign land, a few years ago, that such a panic had been felt in England about invasion as to lead to the expenditure of £12,000,000 on fortresses, he felt somewhat inclined to be ashamed of his country. In the estimate he had made he had not gone at all into details, but he might just mention one or two matters which had to be provided for. In the first place there were the officers to pay, and they would no doubt be much pleased to hear that Sir Charles Trevelyan's suggestion for increasing their pay was to be carried into effect. Then there were the non-commissioned officers to drill them, the commissariat to feed them, and medical men to look after them, clerks to keep accounts, &c., and postage. All these things might seem small in themselves, or when connected with an army of forty, sixty, or a hundred thousand men, but when they came to deal with two millions, they would add up to an enormous amount. It was only necessary to state the case thus plainly to dispose of it; and if Parliament, with such figures before it, paid the least attention to such a scheme, he should be very much surprised.

Mr. COLE, in replying to the observations which had been made, wished in the first place to clear himself from the imputation which had been thrown out against him by some of his friends, that he had libelled the army. The fact was he had passed no opinion of his own on the army. He had looked into various authorities, and had quoted what he found there, and he supposed what was stated in a Parliamentary Blue Book, printed only two years ago, might in general be relied upon. In order, however, to clear himself in the eyes of some valued friends in the army, he would give up his authorities in full, who were responsible for the adventurous statements he had ventured to make. He was now told that they had ceased to recruit in the same way as formerly, that the soldiers were not more vicious than the average population, and that they had immensely improved; of course he could not say that what happened yesterday still existed to-day, but the last authorities he consulted were Her Majesty's Commissioners, Lord Dalhousie, Lord Eversley, and Adjutant-General Lord William Paulet, and the other commissioners, who he supposed might be believed. These were their own words:—"The present system of recruiting rather seeks to inveigle young men into the army, than by a fair representation of military service, and an honest and open declaration of the advantages which a military career presents, to hold up the army as a profession, of which a fair proportion of those who are capable of bearing arms might well avail themselves." Then, again, he quoted the late Sidney Herbert, who said:—"We get our men, with difficulty, by every kind of cajoling and inducement we can devise; and, in our necessity, descend to those means which men do not have recourse to till they think all others are exhausted." Then, again, the Commander-in-Chief was asked—"Your Royal Highness must be aware that the mode of re-

cruiting for the army at present is not the most creditable which might be observed in inducing young men to enter the service?" And what did he say? "No;" and he did not suppose Sir William Denison would say a word against that.

Major-General Sir WILLIAM DENISON said that referred to the mode of recruiting; his objection was to the description of the man's character after he was made into a soldier.

Mr. COLE continued.—The next question was—"Could your Royal Highness suggest any mode of improving that system?—I think that it would be impossible? With the volunteer system you must get the men where you can find them. Of course, if you can get a better class of men, so much the better, but our experience has not proved that we can do so; and, therefore, my fear is that, do what you will, you must take what you can find, whether it is exactly what you wish or not." Then the last question was—"And even though you wish it, you cannot be very particular as to the place in which you recruit?—No; I do not think that you can help that." He hoped, therefore, that he had relieved himself of the charge which had been brought against him, and as to the men themselves, he had spoken of them as being unrivalled for enduring pluck, and making the noblest soldiers in the world. However, all that was completely beside his argument, which was simply this, that the existing system cost a great deal too much, and was in fact the most monstrously extravagant and indefensible system in the world. Were they so differently constituted from Frenchmen that their soldiers must cost three times as much? A French soldier cost about £36 a-year, and why should an English one cost £111, according to last year's estimates. The cost of living and house rent were not so very different in the two countries, and the French soldiers, though they might be beaten by the English, were quite as good as was necessary.

Admiral SARTORIUS remarked that the French soldiers were not volunteers.

Mr. COLE said that he could not see that it was at all necessary that an English soldier should cost three times as much as a French one; and the real cause was our wretched administrative system. He really could not forbear quoting from the *Saturday Review* of Saturday last a short passage on this subject:—"A chief is wanted to supervise the whole department of supply, and what do we find? Why, we have two generals, Sir Henry Storks and General Balfour, assigned to this work at the War Office; and a third magnificently paid general, called a quartermaster-general, to do substantially the same work at the Horse Guards. Of these three only one is wanted, and it is well known that the principal duty of the quartermaster-general is to make routes, and to send requisitions for stores to the twin department which exists at the War Office. Then, again, there is a Military-Secretary at the Horse Guards, and his counterpart at the War Office, in the shape of an Under-Secretary of State, developed out of what once was called the Secretary for Military Correspondence. The necessity for these offices is created by the dual system, and one, if not both, might be dispensed with if the general wielding the powers of the Commander-in-Chief were placed at the elbow of the Minister as his military adviser. Then, again, we have at the Horse Guards three adjutant-generals—that is to say, the Adjutant-General of the Army, who alone is needed, and two deputy-adjutant-generals, quite independent of the first, who report direct to the Duke of Cambridge as the immediate commander of the engineers and artillery respectively. Not only are all these needless and costly offices established as a consequence of the dual government, and of the quasi-independence of the Horse Guards, but a very large per-centage of the work of the two departments consists of tedious correspondence and wrangling about trifles, between Pall Mall and Whitehall." That was one of the reasons why an English soldier cost £111. He had in his hand a Parliamentary paper,

entitled an annual return of the accounts of the manufacturing establishments under the War Office, extending to 274 pages, which anyone could purchase for 2s. 10d.; it was issued on the last Saturday, and some of the items were so extraordinary that he must quote them. These accounts were signed by Mr. Whiffin, the chief auditor, and also certified by Col. Boxer and Brevet-Major Arbuthnot and others, and finally by the Secretary of State for War; they disclosed such a system of petty espionage and needless detail as was astonishing, and would ruin any commercial firm. There was an item for putting new straps to seven cavalry capes; the value of the material was put at 1s. 2d.; cost of piece work, 4d.; direct labour, estimated at 2s. 4d.; indirect labour (including, of course, the proportion of Col. Boxer's services), 5d.; total expenditure, 3s. 11d.; all marshalled in columns, which was the most costly kind of printing. The next item he would read was that relating to one cape which wanted repairing, the cost of which was 3½d., every item being entered as before; next, there was one of these capes which, it seemed, wanted "ripping," for which the piece-work was 1d., total direct labour 1d.; nothing was charged for indirect labour in that instance. In another case there was an entry where the Stores Department had to issue some miscellaneous goods, for which wages were charged 1d., direct expenditure, ½d., indirect expenditure, ½d., total, as per balance-sheet No. 1, 1½d.; total, as per balance-sheet No. 2, 1½d. All that nonsense ought to be got rid of at once; no one, military or civil, could defend printing such petty details as those at the public expense. Then, again, as to the question of cost. Was Sir William Denison aware that we still had about four millions to pay for the Abyssinian expedition? We were assured that five millions would be ample; but it was found now that every soldier taken to Abyssinia and back cost the country about £900, and the total cost was nine millions. We went to work in what he had heard described as a "frenzy" of extravagance. There must have been most wasteful and extravagant expenditure to account for such an outlay. He had wished to avoid these details, but they had been forced upon him. The other day he had quoted what was said by Major Edwards, that with all this extravagant expenditure we were not able to put more than 30,000 men into the field, and were no better prepared for war than at the time of the Crimean campaign. Was that true or not? No one had contradicted it; and if it were true, who was responsible to the taxpayers for such a disgraceful state of things? He would sooner run the risk of sweeping away the whole system at once, and then setting about a scheme of re-organisation, with the aid of his friend Sir William Denison, than allow such a condition of affairs to remain; and he might add that on Saturday only he had been assured by a general officer that the statement was quite true. If that were so, the statement having been made some years ago, it was discreditable to the Parliament, the military secretary, the Commander-in-Chief, the military officers, and every body concerned in the business. The instant such a fact was known it ought to have been remedied, but it never would be remedied until the present system was swept away. He had stated that in England there was an officer to every 18 men, but, on going more minutely into figures, he found that last year there were 6,549 officers, and 116,000 rank and file, so that, in fact, there was an officer, attached or unattached, to every 17 men; no wonder the cost was £110 per head per annum. What was the use of Parliamentary responsibility if such abuses could not be got rid of? He would like nothing better than to show how well the army could be done for at the rate of £8,000,000 a-year. And he was encouraged in his belief by seeing what Mr. Cardwell has done in three months. The army estimates for 1869-70, issued that very morning, he ventured to say, were an honourable achievement full of promise—reducing the cost more than a million. He

prayed that Mr. Cardwell would go on reducing a million every year for seven years, and then what the *Times* was pleased to call his (Mr. Cole's) "colossal designs" would be accomplished. Sir Wm. Denison had fallen into a great mistake in supposing that two millions of men were all at once to be drawn from industrial pursuits, to the great injury of industry, and drilled for a year, at a cost of from fifty to one hundred millions. He never proposed anything of the kind. It was quite possible to take 100,000 men a-year, and when they were thoroughly instructed in their duties, replace them by a fresh detachment, and at the end of twenty years they might have spent, perhaps, fifty millions, and to that there would be no objection. Then again, the bugbear had been brought up by Sir William of all the young men of the country being taken away from their employment and their sweethearts, but this was disposed of in the same way. They would not be taken away—and it was to be seen that training one in thirteen of the population would not be more damaging to industry in England than it was in Switzerland, where, as he had said before, everybody learns to read and write. Another error into which Sir W. Denison had fallen was this. He had represented him (Mr. Cole) as proposing to at once disband a standing army of 130,000 men, and his comment was that there would be an army of paupers at once. Again, he said, he had not proposed anything of the kind, but on the contrary had stated that the system would take at least seven years to introduce and work out; but what a satire was this on the present standing army, to say that they would at once become paupers! He did not believe that such would be the case, though, perhaps, some would turn thieves, if ever such a foolish proceeding were adopted. Allusion had also been made to a universal system of drilling interfering with the national industry, but, on this point, he would quote a passage from a letter addressed to himself by a very large employer of labour, having works in the midland and northern counties, who was a Member of Parliament, and his son also was a member, both gentlemen occupying a high industrial position. He said:—"I should like to tell you that I heard the opinion expressed by many manufacturers in France and Germany, and more especially by Monsieur Lorschach, the Director of Krupp's works, that a short term of military service greatly increases the usefulness of young men working in large factories. They become punctual, ready and amenable to discipline." One part of his argument throughout was, that if the things were properly adjusted, so far from interfering with the industry of the country, by taking a man away for say 20 days and drilling him, his industrial power would be much increased, and if they began with young children the advantage would be still greater. With regard to the colonies, he deemed it quite possible to keep troops there, but he saw no reason why they should not be treated in the same way as the mother country. He did not want to turn the colonies adrift, but for them to undertake their proper share in the business of defence. Why should not a colony like Australia, with a population which would soon exceed that of England, provide the main body of her own soldiers? As to India, that would form an admirable subject for discussion on a day specially appointed, but for the present he must pass it by. There was no doubt that Mr. Spencer Walpole, Colonel Ewart, R.E., and one or two other speakers had hit the mark when they said the question was whether it would be better to engage and train only a small number of soldiers as a standing army, which was against the constitution and common law, or to put our military forces on a footing more proportionate to that of other European nations, and to engage, under some arrangement the most convenient possible to all parties concerned, the whole of the population in self-defence? That was the gist of the whole question. If the public really preferred an

extension of the present costly system, including the publication of such returns as he had quoted, the grand result being that each man cost about as much as three French soldiers, then he had been preaching in vain; but he did not think such an opinion would prevail when the question was thoroughly understood. He would quote from the preamble to the "Mutiny Act" for last year—"Whereas the raising or keeping a standing army within the United Kingdom of Great Britain and Ireland in time of peace, unless it be with the consent of Parliament, is against law." Every year a sanction to breaking the law was necessary, and he contended, therefore, that it was at all times open to Parliament, and especially a new Parliament, to reconsider the whole question. The standing army, as it at present existed, was the creation of the last 200 years, a great part of which, certainly 100 years, was without exception the most inglorious period of English history. We had spent 400 millions of money, the burden of which would hang perpetually upon the industry of England, in order to prevent anyone bearing the name of Napoleon ever sitting on the throne of France; and what was the result? We had a good friend to Arts, Manufactures, and Commerce on the throne of France now. If we saved seven millions annually for fifty years we should nearly pay off the National Debt incurred for that stupendous folly. There had been changes and reforms in every department, both of Church and State, and why was the army alone to be held sacred? During this time the cultivation of fine arts had so degenerated that the English were described as having the worst taste of any people in Europe, and it was thought necessary to have a South Kensington Museum to remedy the disgrace. We had now done away with rotten boroughs, though when the standing army was first established Old Sarum returned two members to parliament by the voices of three electors; Roman Catholics were persecuted, and the corn laws were in force; all these corruptions or solecisms had been got rid of, and why should not the standing army follow in their train? He must apologise for having in the paper recommended a standing army of 16,000 men—there ought to be no standing army at all; and, in order to prevent mistakes, he would say what he considered there ought to be. In the first place, he would assume that, for the present, there should be the same proportion as at present of artillery, cavalry, engineers, &c., with the officers commanding these branches of the service. Next, he proposed to have, in the course of the next three years, 200,000 men ready to bear arms, with the same proportion of officers, artillery, &c., as at present, and all this could be provided at a cost of about £2,500,000, according to the plan which he had shadowed forth in the paper. He would, of course, have the requisite number of well-disciplined militia and volunteers put on a proper footing, and the police also, according to Mr. Chadwick's idea, might be made available if necessary; and it must not be forgotten that the boys were to be trained at school. The figures just quoted had been worked out for him by an able officer of the Royal Engineers, and he had no doubt of their accuracy. He did not intend that the boys should be drilled on their half-holidays, which would be simply a bore, but in the ordinary routine of their duties. The soldiers should be allowed to work, instead of committing suicide from sheer idleness, and of course the militia would be thoroughly reformed. In conclusion, he had only to say that he intended to move for a committee, to be, of course, composed principally of military men, though he hoped the presence of a civilian or two would not be objected to, to inquire what could be done for eight millions. Of course, if the suggestions were good, they would bear scrutiny, and if not, they would go to that place which is "paved with good intentions."

The CHAIRMAN said it would be presumptuous in him, as a civilian and manufacturer, to detain the meeting by attempting to give a *résumé* of all the arguments which

had been advanced during the discussion, but there were a few practical matters which had come under his own notice which he might mention. There was no doubt that the two main questions now occupying the attention of the country were economy and education. With respect to economy, he was of opinion that, without reducing a man or a gun, or changing the present system in the least, there was immense scope for retrenchment in both army and navy. He was doubtless somewhat in the position of the oft-quoted tailor, but at least he understood tailoring; in other words, as a business man he understood business. In saying this, it must be understood that he had the highest possible opinion of the men of both services, but the administrative departments were a disgrace to the nation. It was confessed that at the Admiralty, without touching a man or a gun, Mr. Baxter had already saved a million of money. The grossest jobs were constantly perpetrated in both services, both on the part of those who purchased on behalf of the Government and the contractors. He had seen soldiers robbed in a manner perfectly cruel, by the mode in which the contract system was conducted. For instance, he had known such a thing as this, which he had brought under the notice of the authorities of the War Office—cavalry drawers were made at Nottingham, sold to a commission agent in Dublin, re-sold to a wholesale house in Dublin, again sold to an army tailor in London, and sent into the War Office in Pall Mall, at an advance of about 33 per cent. on the original price, and then the soldier was charged with these articles as necessities. He believed that at the present moment the corruption in the contract departments was a disgrace to all parties connected with it. Then again, too, there was the perpetual conflict between the War Office and the Horse Guards, which led to the greatest possible confusion. What the civilians attempted to do, the professional men tried to undo, so that, he believed, chaos itself could hardly be worse than the War Office at the present moment. He believed that Her Majesty's Government were honestly desirous of putting the army and navy in the best possible state of efficiency, and all were agreed that economy was desirable. The more they got for the money of course the stronger would the nation be, and the better prepared for any emergency that might arise. He felt very strongly on the question of education, and having had opportunities of comparing educated with uneducated soldiers, he believed it was impossible to over-estimate the value of education to the soldier. The year before last he had spent a few weeks with a noble lady who lived in a village on the frontiers of Bohemia, where the Prussian troops passed on their way to Sadowa. For seven weeks she had officers quartered in her house, and the neighbourhood was crowded with soldiers, and yet, during the whole of that time she never heard an offensive word, nor did she or her neighbours miss the value even of a chicken. This lady had been brought up at the Court of Vienna, and her prejudices were naturally in favour of the Austrians, but yet she said she was positively ashamed when the Austrian prisoners were brought in, for there was immediately robbery and disgrace all around. Last year he was speaking to a Saxon colonel, who told him he was quite shocked one day to find that there were two men in his battalion who could not read nor write. He called his men together, told them such a thing was disgraceful, and that they must teach these two men at once. These men fought as well as soldiers could fight, and were called wherever they went, "the amiable giants." Many of these men were taken from his own looms, for he had an establishment in Saxony, and for eight years he had never met with a working man in that country who was not able to correspond with him well upon any matter connected with his own business. He did not think Mr. Cole's plan was quite so revolutionary as was supposed, for it came simply to this—increasing the proportion

of volunteers and decreasing that of the standing army; and, to show what might be done to make volunteers realities, he might narrate his own experience. He was one of five in the town of Nottingham who resolved on raising a volunteer corps, and at the commencement he remarked that he was too old to *play* at soldiering, and, if it were done at all it should be done in thorough earnest. Accordingly they started the corps of "Robin Hoods," which had now attained something of a reputation. They got an old Indian officer, who ultimately became adjutant, and from the first they determined not to have a non-effective man in the ranks, which resolution they kept. He was himself captain for some time, and they had as fine a regiment as could be desired, but there was no reason why others should not attain the same excellence. The men did not neglect their business, but learned their drill in their spare time, and were all the better for it. The result was that last year the adjutant told him they were a thousand strong, in better condition than ever, and there were plenty of men waiting to join. There was not a man non-effective, 997 were extra efficient, and the remaining three, who were merely efficient, were the Duke of St. Albans (the Hon. Col.), the chaplain, and a little bugler who was not strong enough to hold his rifle straight. They had been repeatedly complimented by military men, and told that they were equal to any regiment in the service, and there was no reason why all volunteers should not reach the same point. The men were only drilled after work hours, but they commenced on a good system, and were well looked after, and there soon sprang up an *esprit de corps*, which continued and kept alive the good work which had been begun. In his own company he had 87 per cent. marksmen, a thing which was unknown in the regular service; and this showed, therefore, in his opinion, the advantage of having a higher class of men to deal with. Nor were these men in any way disqualified for their ordinary occupations; many of them were employed in his own warehouse, and the improvement in their appearance and demeanour was most striking. If he met any of them in the street, instead of slouching along, and looking at the wall because they did not know how to recognise his presence, they now stood upright, and gave the military salute, not servilely but civilly, and he was convinced that their efficiency in work was much increased by the exercises they performed. He saw no reason why there should not be an immense development of the volunteer force, for, in his opinion, Englishmen were full of military spirit, if it were only properly brought out. He would not say that all Mr. Cole's wishes would be accomplished, but even Sir Wm. Denison would agree that a much greater development of the volunteer force was both desirable and possible, coupled with extensive reforms in the administration of the army. He agreed with Mr. Campbell that it was necessary to keep a considerable European force in India, but he was also convinced that the present term of service was too long. Many evils arose out of this system which had been alluded to, and though it might be difficult to draw the exact line as to what was the proper term, short service was, in his opinion, undoubtedly preferable to the opposite system. A man who had been in the army for many years was too old to turn readily to civil employment, or to re-learn the trade which he had formerly practised; whilst the young soldier returned to civil life invigorated and improved by the discipline he had undergone. In conclusion, he proposed a cordial vote of thanks to Mr. Cole, whom he had known for many years, and whose administrative abilities, which he had had opportunities of observing, were equalled by few. The paper he had read had produced a most interesting discussion, and he hoped would lead to some practical results.

Sir CHARLES TREVELYAN said he understood it was not the practice to pass a vote of thanks to the chairman, but he might take the opportunity of remarking that hardly

anyone could have been selected more fitted to preside over such a discussion, he being a large employer of labour, not only in England but abroad. He understood that the present assembly had been called in ridicule "King Cole's Parliament;" but, for his own part, to his dying day, he should be proud of having taken part in its deliberations, and desired to add his tribute to the merits of the Council of the Society of Arts, the gentlemen who had summoned it.

SIR WILLIAM DENISON desired to support the vote of thanks to Mr. Cole, for whom he had the greatest possible respect, although on the present occasion he believed he had made a great mistake.

The vote of thanks having been passed unanimously, Mr. COLE briefly replied, and referred to an article in the *Times* of that day, the concluding lines of which he quoted, to the effect that in a vast extension of our reserved forces lay the only true means of providing efficiently for self-defence.

### THIRTEENTH ORDINARY MEETING.

Wednesday, March 3rd, 1869; Lord FREDERICK CAVENDISH, M.P., in the chair.

The following candidates were proposed for election as members of the Society:—

Allender, G. Mander, 6, Dawson-place, W.  
Berrington, Arthur, Pant-y-goitre.  
Perdicaris, Ion, 2, Heathcote-villas, St. Margaret's, Twickenham.  
Portman, Hon. Edwin B., 3, King's Bench-walk, Temple, E.C.  
Sooby, Thomas Hill, 12, Lansdowne-terrace, Kensington-park-gardens, W.  
Stokes, Thomas N., the Priory, Totteridge, Herts.  
Worthington, Robert, Salmon Pool-lodge, Island Bridge, Dublin.

The following candidates were balloted for, and duly elected members of the Society:—

Dermer, Edward C., 3, Barnes-villas, Barnes, S.W.  
Fentiman, John W., Devonshire-cottage, Balham, S.W.  
Gassiot, John P., jun., 6, Sussex-place, Regent's-park, N.W.  
Harrison, Peter, Keswick.  
Helme, Robert, The Forest, Walthamstow, N.E.  
Hoccombe, James B., 13, Bedford-row, W.C.  
Hyam, Frederick, 109, Westbourne-terrace, W.  
Leslie, Francis Simon, Ealing, W.  
Lloyd, Frederick George, The Winns, Walthamstow, N.E.  
Matthews, George Kelly, St. John's-lodge, Beckenham, Kent.  
Maude, Colonel Francis Cornwallis, 75, Onslow-square, S.W., and Army and Navy Club, S.W.  
Robertson, William Wybrow, 1, Whitehall, S.W.  
Williams, Morgan B., 15, Hyde-park-gate, Kensington-gore, W.

The Paper read was—

### ON THE ADAPTATION AND EXTENSION OF PRESENT MEANS FOR SCIENTIFIC INSTRUCTION.

By HENRY H. SALES, Esq.

The amount voted for the service of the Department of Science and Art for the year ending March 31st, 1868, was £144,158 19s. 6d. Of this sum only £18,900 was expended upon science schools, including payments to teachers upon results, prizes of books, grants for examples, local secretaries for examinations, and scholarships. The number of persons under instruction in science schools in May, 1868, was 14,600. Of this number only 8,763 passed the examinations of the Department, 4,460 were plucked, and 2,377 did not present themselves at all. At the Oxford local examinations, held June, 1868, 1,109 juniors and 397 seniors were examined. Only

94 juniors took the papers in mechanics and mechanism, 67 being successful, and 68 ditto in chemistry, 35 being successful. 45 seniors were examined in electricity, &c., and 25 successful; 33 ditto in chemistry, and 22 successful. At the Cambridge local examinations, held December, 1868, of 1,164 juniors only 79 were examined in mechanics, and 56 in chemistry, and of 218 seniors, 12 presented themselves in chemistry, and 7 in electricity. With these figures before us we may readily adopt the words of a writer in the *Edinburgh Review*, and say "That no country in the world approaching to England in manufacturing eminence is so radically deficient in special industrial education. Broadly viewed, the whole system of technical education has, at this late date, to take root and grow in our soil."

Continental procedure in education in no respect contrasts so strongly with English action as in the results evidenced by the general intelligence of their manual labour population compared with our own. A commentary upon continental primary education would to-night be foreign to my purpose. I only allude thereto in order to justify the opinion I hold respecting the first duty of the present promoters of scientific instruction. The rapid means of communication that now exist, not only between the principal towns of Great Britain, but between those towns and the chief seats of manufactures on the continent, render the general establishment of science colleges for persons in easy circumstances, who intend their sons to be engaged in scientific pursuits, not the first matter of pressing importance. But science for the million is the present desideratum. In entering upon the consideration of the best means for its promotion, a general survey must be taken of the present condition of primary education, and of the results produced in the State-aided schools.

On May 4th, 1868, an educational return was presented to the House of Commons. It contains the following figures:—

Average number of scholars in attendance in day schools .....	836,395
Ditto night schools .....	43,017
Ditto day schools not receiving annual grants .....	125,383
Ditto night ditto .....	11,293

Total ..... 1,016,088

Total per-centage on population of average number in attendance, 5·36.

Confining our attention to the 836,395 scholars in average attendance in the State-aided day schools, let us note the reports upon them by Her Majesty's Inspectors of schools for the years 1867 and 1868.

Rev. J. R. Blakiston, M.A., on Schools inspected in Leicester, Northampton, and Rutland:—"Arithmetic is at a low ebb throughout the great mass of the schools which I have inspected. If questions be put demanding the least thought on the children's part, they are found utterly at a loss. Even in subtraction sums, if the less number be given out first it very often remains uppermost, and has the greater number taken from it."

Rev. W. Campbell, M.A., on Schools inspected in Middlesex and Surrey:—"The reading of the older children, although perhaps fluent enough, wants that intelligence and expression which result from a clear knowledge of the meanings of the words employed, and a fair appreciation of the general sense of the passage. This I believe to be caused by the teacher having been content to arrive at nothing more than a mechanical readiness of utterance, which he supposes to be all that is required to ensure a 'pass' mark to the reader. I am afraid that the old custom of questioning upon the passage read, and explaining the force and meaning of the words of which it consists, prevails but too little in the very best schools. At least, I have asked in such schools the meaning of the words 'similar,' 'diminution,' 'numerous,' &c., but without success."

Rev. W. J. Kennedy, M.A., on Schools inspected in South Lancashire:—"I can scarcely imagine anything worse than the reading of poetry in the 5th standard generally is. It is, with very few exceptions, thoroughly defective, and I pass the children only because they are nearly all bad alike; and I am compelled to acquiesce in a very low standard of merit."

Rev. G. R. Moncrieff, M.A., on Schools inspected in Kent:—"I have been very much struck with the inability of boys in the upper standards to think out a simple practical question in the rules of arithmetic belonging to their year. The reading of standards 4 and 5 is seldom satisfactory. Most of it passes; little of it approaches being good."

Rev. J. C. Robinson, M.A., on Schools inspected in Buckingham and Hertford:—"I conclude from the facts of the past year that the state of elementary education in the two counties remains without noticeable alteration since I reported to your Lordships two years ago. I had at that time to point out in various particulars the deterioration which had taken place in most of the schools under inspection. The permanent quality and value of the education given had appreciably fallen; and further experience has not modified in any sensible degree the conclusions at which I then arrived, although in the separate details of school management varied conditions are year by year observed."

Rev. W. Warburton, M.A., on Schools inspected in Hampshire:—"The elements of reading are certainly imparted with more method, rapidity, and success than formerly, but it never seems to get beyond a certain point of excellence; as the children rise into the higher standards they are able to read longer and harder words, and that is all. I do not remark a progressive improvement in intelligent and expressive reading in proportion as children are longer under instruction. The inspector can hardly refuse to pass boys and girls who glibly read off, and correctly articulate, words of four and five syllables, however evident it may be that they have no conception of what the author meant to convey; and though they read the whole in one note, or only dropping the voice at certain mechanical intervals, as if trying to read on the principle of a Gregorian chant, with a total absence of feeling, emphasis, and undertone."

Rev. F. Watkins, B.D., on schools inspected in Lincoln, Nottingham, and York:—"Of the 11,410 children examined under the code from the day schools—

10,427, or 91½ per cent., passed in reading.
9,719, or 85 " " writing.
8,624, or 75½ " " arithmetic.

"Of the children examined, 91 per cent. can read sufficiently well in their different tests to satisfy the demands of the code. But the children examined are not quite half of the whole number in attendance; so that the per-centage drops at once from 91 to about 45, and this latter number represents the per-centage of children in a school who can read passably. By this term I understand fluently, correctly, and with proper observance of stops; but I have never held it to require expressiveness in reading, which alone shows intelligence of the subject-matter, and is of any real use to the reader. I must record my conviction, from two more years' work, that the character of reading required under the code, and obtained by it, is altogether insufficient and almost illusory. It does not convey the idea that the reader is interested in his book, or hold out the hope that he will voluntarily take to it when he is his own master in life. The meaning of any but the commonest words is generally unknown to him, and allusions to other matters—places, persons, things—are for the most part thrown away upon him."

J. G. Fitch, Esq., M.A., on British and other Protestant schools in Yorkshire.

Mr. Fitch has made an elaborate calculation "in order to estimate approximately the number of those who, in

the present system, may be expected to be classed in the higher standards before leaving school." His results show that 77·4 per cent. of those examined will ultimately reach the fourth standard; 34·2 per cent. of the whole will reach the fifth; and 11·4 per cent. will reach the sixth. Mr. Fitch remarks—"Considering that to pass in the sixth standard requires no higher attainments than the power to read from a newspaper with moderate fluency, to write a sentence from dictation, and to work sums up to practice, this result is not one which justifies much boastfulness. It is quite possible for a boy to attain this point without receiving much intellectual stimulus or exercise; and it is to be feared that even his education, unless supplemented by the evening class or the people's college, by the Christian institute or by reading habits, will remain miserably incomplete. Yet anything short of this standard is still more unsatisfactory; and in view of the demand now so loudly made for workmen of higher technical skill, it is melancholy to record that nearly 90 per cent. of our present scholars leave the primary school not only uninstructed in the elements of science, but also destitute of that rudimentary knowledge, without which all future teaching of science, even if it were offered to them, would be well-nigh unintelligible."

In a memorial presented last month to the Lord President of the Council, by the London Church Schoolmasters' Association, and from other friends of education, residing in and around the metropolis, is this noteworthy statement—"The experience not only of teachers, but of almost every one engaged in popular education, proves conclusively that the revised code has had generally a disastrous influence. It imposes an unfair test of results; it has given a mechanical character to the instruction in our elementary schools."

The conclusion to be drawn from these reports is unmistakable. About one million and a quarter of children are under instruction in State-aided schools. It may fairly be assumed that the standard of attainments is at least equal to that in other schools for the same class of the manual labour population. From these schools boys go forth to a life of labour, which is for the most part skilled labour, deplorably deficient in the rudiments of education, and with the inherent intelligence of their race undeveloped. Fortunately, we can place our hands upon one great cause of the present low state of primary education in our best elementary schools. There can be no doubt that the present system of instruction, necessitated by the requirements of the revised code, does not develop the intelligence of school-boys, and is producing merely mechanical results. Mr. Matthew Arnold reports, "The mode of teaching in the primary schools has certainly fallen off in intelligence, spirit, and inventiveness during the four or five years which have elapsed since my last report. It could not well be otherwise. In a country where everyone is prone to rely too much on mechanical processes, and too little on intelligence, a change in the education department's regulations, which by making two-thirds of the Government grant depend upon a mechanical examination, inevitably gives a mechanical turn to the school teaching, and a mechanical turn to the inspection is, and must be trying, to the intellectual life of a school. In the inspection the mechanical examination of individual scholars in reading a short passage, writing a short passage, and working two or three sums, cannot but take the lion's share of room and importance, inasmuch as two-thirds of the Government grant depend upon it."

The present condition of the State-aided schools was foreseen by all practical teachers when the Revised Code was first propounded. That I may not weary you with extracts from innumerable speeches and publications, I will only refer to a small pamphlet on "Public Education," written in 1861 by Mr. J. G. Fitch, M.A., then Principal of the Normal College, Borough-road. After giving a number of quotations from the reports of Her Majesty's Inspectors for the preceding year, commendatory of the

intelligence of the children, Mr. Fitch writes:—"The Inspectors are aware that good reading, such as gratifies the enr of an educated man, is one of the rarest accomplishments; that it is seldom attained, even among the upper classes of society; that it cannot be got by persistent mechanical teaching of the art of reading as an art, but that it comes with culture and thoughtfulness, and is rather the result of intelligent teaching in other subjects. . . . The Inspectors have no interest in hiding the deficiencies of the schools. They have brought them to light, from time to time, in the most unsparing way. But the whole tenour of their evidence proves conclusively that the reading, writing, and arithmetic are steadily and rapidly improving from year to year, and that judicious intellectual instruction in other departments acts favourably on the understanding of these rudiments. It is also remarkable that imperfect instruction in reading, writing, and arithmetic is found in the worst schools—not in those in which higher instruction is given. Where the master has received the best training, and the higher classes are most intelligently taught, there the teaching of reading, writing, and arithmetic in the lower classes is invariably the soundest and most effective. If it were not so, the Committee of Council has the remedy in its own hands. It has steadily directed the attention of its Inspectors to the importance of looking after elementary subjects; and it has done this with the happiest results. By continuing to do this, it will still further check all tendency to pretentious and unsound teaching. But to deprive an earnest teacher of all sympathy and recognition in relation to his plans for imparting a love of study and inquiry to his scholars, will only have the effect of giving him meaner notions of his duties, and reducing the work of the whole school to a mechanical level."

The Committee of Council have given a sign of their consciousness that educational "results" are other than mechanical reading, mechanical writing, and mechanical arithmetic. The rigidity of the Revised Code has been slightly relaxed. By a minute of Council, dated February 20th, 1867, provision is made for an additional grant of 1s. 4d. per pass in reading, writing, or arithmetic, up to a sum not exceeding £8 for any one department of a school, on condition that at least one-fifth part of the average number of scholars over six years of age pass a satisfactory examination in one or more specific subjects beyond those prescribed by the code. The Rev. R. Temple, M.A., in his report on Cheshire, writes:—"The minute of the 20th February, 1867, so entirely coincides in its aims and methods with the views which I ventured to express two years ago, with regard to the necessity of instruction in the higher subjects of history, grammar, geography, &c., for the purpose of calling out the intelligence of the scholars, that it would be presumptuous in me to say as much in its praise as I think it deserves. I cannot, however, help feeling a little triumph at the fact that the teachers of my district, who have, I know, been inclined to think me rather unreasonable in my demands for the higher subjects, are now reaping the benefits of my mode of examination, as their scholars were in most cases prepared to satisfy the tests of the new minute at once, and so the schools in my district have generally obtained the additional grant in the first instance." Here, however, our commendation of the action of the Committee of Council on Education must cease, for, in accord with the incongruity that has hitherto pervaded the action of "My Lords," and to which educationists must submit until a Minister of Public Instruction unites the two departments of education in a symmetrical whole, it is provided that while any branch of science may be taught as one of the secular subjects, yet the science system of the Science and Art Department shall not be recognised during the three attendances of an elementary school receiving aid from the Educational Department, Whitehall.



We now arrive at the first adaptation of present means for scientific instruction. The intelligence of the children in the State-aided schools is undeveloped by the mechanical teaching enforced by the revised code. The Committee of Council acknowledge the evil, and desire to stimulate instruction in higher subjects. Instruction in the rudiments of science, while of great value as forming the alphabet of technical education, is also a powerful means for developing the intelligence of school-boys. Then remove the restrictions that now bar the science system of the Science and Art Department from schools under the Educational Department, Whitehall, and the rudiments of science will become a part and parcel of primary education. Mr. Henry Cole only expressed the opinion of most persons who have studied this subject when, in his letter to the Vice-President of the Council, published in the Appendix to the Report from the House of Commons Select Committee on Scientific Instruction, he wrote:—"I recommend that the managers of elementary schools be free to establish classes for teaching science through certificated teachers, and that payments on results be made to them, and that all fears of competition with elementary education be ignored." Further, in a paper handed in to the same Committee by Captain Donnelly, entitled "Memorandum of suggestions for enlarging the system of State-aid to Scientific Instruction, drawn up in accordance with the instructions of the Lords of the Committee of Council on Education," is the following important passage:—"To meet the wants of the younger artisan class, it appears to be only necessary to remove some existing restrictions which prevent payments being earned for instruction in science given during the three attendances of an elementary school receiving aid. This restriction was imposed when the schools were aided under the whole system, which it was considered justified and required some check of this kind. If teachers of elementary schools were permitted to earn payments for the instruction in science, as in drawing, of the more advanced students in these schools, the results of the present science system show conclusively that they would very soon form such classes, and would induce a considerable per-centage of the parents to allow their children to remain longer at school. Probably it would be advisable that the payments should be made through the Education Department, who would then have full control of the matter. The Science and Art Department, acting according to its present system, would simply have to make a return of the results of the examination to the Education Office. To meet the requirements of these schools, it would be advisable to have a sixth standard of examination below the present fifth class, and make a payment of 10s. on passing it. Whether it would be advisable to make any restriction as to the subjects of instruction or not, is doubtful. It is generally better to leave this to work itself out."

The Council of the Yorkshire Board of Education, seeing the necessity for early instruction in the rudiments of science, and conscious of its importance to the manufacturing community, have decided to do their part in hastening its introduction into primary schools. A systematic extension of the system of professorial lectures, based upon the scheme introduced by Dr. Bond into the Hartley Institution, Southampton, has been resolved upon. A course of thirty lectures will be given on the Elements of Chemistry as applied to Manufactures in each of the following towns:—Bradford, Halifax, Huddersfield, Leeds, and Wakefield. The lectures will be delivered weekly, during the session commencing October 4th, 1869. All pupils in the primary schools who are at least eleven years of age, and who have passed the Government examination of the fourth standard of the Revised Code, and paying an entrance fee of one shilling, are to be admitted to the lectures. No other charges to be made. Each pupil must undertake to present himself for examination, at the examinations of the Department of Science

and Art, May, 1870. Pupils who are members of an ordinary science class taught by the master of the day school to which they belong, will be examined in connection with the said class, and as members thereof. Other pupils will be examined as members of the central class. The schoolmasters of these pupils shall receive from the General Council the sum of 30s. for each successful candidate of the first class; 20s. ditto of the second class; and 10s. ditto of the third class; provided that one lesson of not less than one hour in length, on the subject of the central lecture, be given by them weekly during the session; and that the General Council have the power to certify themselves, in any way they may deem desirable, that such instruction has been duly given. It is intended that the expenses of the central lectures, estimated at £250, shall be defrayed from a special fund raised for that purpose. Respecting this scheme, the *Times*, in a leading article, of November 9th, 1868, remarks:—"The Board is endeavouring to supply the link which will be necessary to connect elementary education with the higher grades of instruction. They propose to establish professorial lectures for the elder pupils of primary schools, which will supplement the lessons of the masters. The boys will assemble weekly for this purpose in convenient centres, and it is hoped that a basis may thus be afforded for trade schools in our chief manufacturing towns. One of the wishes Mr. Whitworth expressed, was, that the Government would assist in providing professors of mechanical science throughout the country; and, if this design could be carried into execution, it would exactly fall in with the plan proposed in Yorkshire. If the scheme thus sketched be completed, it is evident that a complete and graduated course of scientific instruction will be established; and it will have been provided in the only satisfactory way—by local efforts, supplemented and guided by the Government."

There is another serious impediment to the present introduction of scientific teaching into primary schools, beyond the Whitehall restrictions. The great bulk of the schoolmasters now annually sent out of the training schools are ignorant of the first principles of science. Here again is made manifest the short-sighted policy that guided the abrupt and ill-fated movements of the authors of the revised code. Taking alarm at the manufacture of "fine razors to cut grindstones," for so the Right Hon. R. Lowe spoke of the students in training for elementary schools, the curriculum of study in training schools was by the action of the code cleared of all the subjects that were not immediately connected with rudimentary knowledge. Prior to the introduction of the code the syllabus of subjects in which students in training-schools were annually examined included algebra, mechanics, physical science, and higher mathematics; to these were added experimental science (especially as applied to manufactures and agriculture), for those students who remained a third year at the school. Now all these subjects have disappeared from the syllabus. In order to stimulate the employment of competent scientific teachers for the instruction of the training-school students, special grants of £100 per annum were made to lecturers on physical science engaged by the managers. This grant has also disappeared. The Whitehall restriction that fetters the action of South Kensington, to which I have directed attention in connection with the elementary schools, does not, however, apply to the training schools, and accordingly the authorities of some of the training-schools are, on their own responsibility, reintroducing scientific instruction, and receiving payment on results from the Science and Art Department; but that which is optional should once more be made compulsory, so that every trained schoolmaster should be certified as a teacher of the rudiments of science.

The study of science being introduced into the State-aided day schools, and supplemented by the evening science classes, organised in connection with the Science

and Art Department, the general intelligence of the manual-labour population will be developed, and sufficient scientific knowledge will be at their command to enable English manufacturers to compete with their Continental rivals on terms of equality, so far as the education of the ordinary mill-hand and factory operative is concerned. There still remains a stationary manufacturing population for whom adequate provision would not be made by the realisation of the system of scientific instruction I have described. From the ranks of the mechanics and artisans are rising, not only the foremen, overlookers, and heads of departments, but also the manufacturers and employers of labour. It has been estimated that more than two-thirds of the masters and employers of labour in Bradford have sprung from the working class, or are only removed from that class by one generation; and the same remark, more or less, applies to all the manufacturing district of the West Riding of Yorkshire. It is, therefore, needful that provision should be made for the instruction of the children of the men who are emerging from the class of the employed into that of the employers. As a rule, these children are not sent away from home to school, the exceptional cases, for the most part, become inmates of the small private boarding schools, whose limited resources cannot supply the education requisite for them. For the due and proper education of this class the Bristol Trade School is a model that may guide the action of educationists. This school is so well known that it is unnecessary to enter into details respecting it. Speaking in a general manner, it may be said that the school was established for the sons of the higher artificer class, and the small tradesman class. Its object is to teach the pupils science as applied to industrial pursuits. It consists of two departments, a lower school and an upper school. In the lower school the instruction is confined to the rudiments of elementary knowledge. Pupils who are twelve years of age are admitted to the upper school if they are well grounded in reading, writing and arithmetic. The subjects taught in the upper school comprise chemistry, theoretical and applied mechanics, experimental physics, machine drawing, building construction, and mathematics. Fifteen shillings per quarter per pupil, paid in advance, is the school fee. Exhibitions have been founded in connection with the school. Each subscriber of three pounds per annum has the power of nominating a boy to the school without the payment of fees; annual subscribers of two pounds and one pound can relieve the personal payment of the school fees to the respective amounts of their subscription. After passing through the upper school the pupils carry on their education in the evening science classes.

The strict imitation of this model cannot be expected, neither would it be desirable. The principle being preserved, local exigences must determine the form the school shall assume. In some cases more complete work may be done than is accomplished in Bristol. Upwards of fifty years ago was commenced the formation of Mechanics' Institutes for the express purpose of imparting scientific instruction to the manual labour population. Called into existence before surrounding circumstances necessary to their well being were propitious, they have passed through strange vicissitudes. Nevertheless, in our manufacturing districts they have, through evil report and good report, at one time spoken of as the panaceas for all the evils of humanity, at another held up to derision as miserable failures, still gone on increasing in numbers, and in Yorkshire alone during the last twelve months more money has been contributed for their erection or enlargement than at any other corresponding period of their history. But far more gratifying than the bricks and mortar extension is the earnest educational spirit that is being manifested by their managers. For the most part these institutions are thoroughly adapted for the purposes of scientific instruction. An illustration will be far more explanatory than mere assertion. The town of Keighley, in Yorkshire,

situated in the valley of the Aire, is fast rising in manufacturing importance. The chief manufactures are woollen goods and machine making. Its population is about 60,000. By its situation it is easily accessible to the inhabitants of the surrounding manufacturing towns and villages, *e.g.*, Bingley, Skipton, Saltaire, Wilsden, and Cottingley. Its Mechanics' Institution has the honour of being one of the first established in England; it is reputed to be the third in order of time. It is unnecessary to say that the building, which was erected in the infancy of the town, is unsuitable for modern requirements. Its days are numbered, and a successor, designed on an elaborate scale, is being erected. Externally the building will form a handsome Gothic structure, and will be a conspicuous and artistic addition to the buildings of the town. The School of Art, placed on the upper floor, will comprise an exhibition room, mechanical room, painting room, modelling room, casting room, and the usual accessories. On the first-floor will be the library, reading room, conversation room, and offices. The ground-floor will be devoted to scientific instruction. A lecture-hall to seat nearly one thousand persons forms an addition to the building, and will be used in common by every department of the Institute. The estimated cost is £12,000. From this short description it will be seen that the Institution is designed as an industrial college for the Keighley district; and, so far as the architectural arrangements are concerned, is admirably adapted for its object. The plan of operations under the consideration of the directors is equally commendable. It is suggested that a school be established, upon the Bristol model, in the rooms allotted to the School of Science, and that, in combination with the Evening Classes and the School of Art, a complete system of instruction in science and art be organised. It need not be pointed out how readily this scheme will be available for the whole of the district. At Bingley, Saltaire, Skipton, Wilsden, and Cottingley ordinary evening science classes are either in operation, or will be established prior to the ensuing autumnal session. From these classes the most successful students can be passed on to the more advanced instruction that can be given at the Keighley Institute, while the distance from the Trade School is not great enough to prevent the daily attendance of lads whose parents desire for them a higher education than can be obtained in the day schools of the respective townships. Let what is proposed to be done at Keighley be done in every centre of industry, and the English system of technical education will bear comparison with any Continental scheme. If public opinion can only be aroused so that the directors of Mechanics' Institutes may be encouraged in their action, the day is not far distant when such comparison may be instituted. The need for technical education is acknowledged, the machinery is ready, local funds can be had if asked for, the will has only to be exercised, and the work is begun.

So far I have treated of the extension and adaptation of existing means for the rudimentary education in science of the manual labour population, and of the secondary education of the higher artificer class. Next in order of advancement is the provision that it is necessary should be made for the special education in science required by the embryo manufacturers and managers of factories. For this work it appears necessary that a few central colleges of industry should be established. I said at the outset that these colleges are not so pressing a necessity as the general diffusion of elementary scientific knowledge, nevertheless no system of technical education can be complete without them. To-night I do not purpose to raise any question of detail on this part of my subject. As regards the establishment of these special colleges, I am of opinion that local subscriptions, aided largely by Government grants, should be the basis of operations. Once established, the pupils' fees, supplemented by special annual grants from the Parliamentary vote for education, would make the colleges independent of eleemosynary aid. The chief bar to the establishment



of these colleges is the difficulty connected with their foundation. Here and there an isolated effort may be made, and wealthy men may come forward and promote their foundation, but a general movement seems far distant. In examining the sources of local agency that might be used for the promotion of a central college movement we light upon a rich source of wealth. An annual income of half a million, for the most part derived from educational endowments, is either unappropriated or scandalously wasted. The utilization of this revenue is a work worthy to be undertaken by any man who desires to earn an immortal name as an educational reformer. The impediments to be removed, and the vested interests to contend with will make the work most difficult, and, therefore, its accomplishment most satisfactory. In the meantime there is a class of educational institutes that may be utilised as central colleges, and with regard to which only sentiment, and not vested interests, can be opposed to their transformation. Scattered throughout the country are normal schools or training colleges for schoolmasters. In the desire to maintain these institutions as the source of supply of trained teachers, it is to be feared that attention is withdrawn from much concerning them that deserves careful consideration. The following facts will enable us to deduce some practical observations. In the subjoined table is given a list of the male training colleges in England, with the number of students for whom accommodation is provided, and the number in residence at the date of the last returns, in February, 1868:—

	No. of students for whom accommodation is provided.	No. of students resident in February, 1868.
Cheltenham .....	106	65
Peterborough .....	46	29
Battersea .....	107	80
Chelsea .....	106	89
Carmarthen .....	60	18
Carnarvon .....	43	20
Chester .....	70	13
Culham .....	100	39
Durham .....	52	30
Exeter .....	48	28
Saltley .....	125	52
Winchester .....	56	30
York .....	80	40
Southwark .....	100	69
Bangor .....	41	30
Westminster .....	72	62
Hammersmith .....	70	34

The certified expenditure of these institutions for the last year, exclusive of the cost for the practising schools and any extraordinary expenditure, was £44,832 18s. 4d. To meet this expenditure, the Committee of Council contributed the sum of £32,469 17s. 10d., and the parents of students £3,533 15s. 2d., leaving only £9,829 5s. 11d. to be provided by diocesan boards, private subscriptions, and investments. The total number of students in residence in February, 1868, was 728. As the course of training extends over two years, one-half of this number—i.e., the second year students—left the colleges last Christmas, the annual cost to the State, for the supply of 400 trained teachers, is upwards of £80 per head.

The teachers thus supplied to the country were certified as having passed a satisfactory examination before Her Majesty's inspectors in religious knowledge, reading, repetition from memory of 300 lines of poetry or 200 lines of prose, penmanship, arithmetic (including questions which involve the solution of simple and quadratic equations), school management, grammar and composition, geography, English history, so far as to be able to answer questions after a perusal of any one of the standard histories of England, Euclid, books I. to II., with simple

deductions, elementary questions in political economy, based upon the fourth reading book of the Christian Knowledge Society, or that of the Irish Commissioners, vocal music, and elementary drawing. It must be borne in mind that this miserably low standard of knowledge, supplied at an annual cost of £80 per head, is required of men who, for the most part, have spent five years as pupil teachers, and at the end of each year have been subjected to an examination by Her Majesty's inspectors, after having received, in addition to daily employment in an elementary school, five hours' instruction per week from a certificated teacher.

From the foregoing statistics it will be seen that there are seventeen distinct institutions called training colleges in England. Accommodation is provided in these colleges for 1,282 students, but by the last returns only 728 students were in residence. The instruction now given is of the most elementary character. These colleges are almost entirely supported by grants from the Committee of Council on Education, at an annual expense to the country of upwards of thirty-two thousand pounds. In addition to the Government grant, upwards of two thousand five hundred pounds is paid by the students in fees, the trifling balance being defrayed by private subscription. These colleges are, therefore, entirely State institutions, and, consequently, there can be no reason why they should not become the subject of criticism with the view to their adaptation to present educational requirements. Here let me remark that the question of trained *versus* untrained teachers does not present itself. Very few persons will assert that it is unnecessary to train persons for the office of schoolmaster, and we may assume that training colleges *per se* are State necessities. But, after it is admitted that training colleges are an integral part of any system of national education, it is still a subject for discussion whether, as now constituted, they are doing all the benefit to education they are competent to do, and whether the lavish expenditure of the State is producing sufficient results.

I have already spoken of the introduction of scientific instruction into the primary schools as a matter of urgent necessity, in order to counteract the mechanical teaching prescribed by the revised code, and the consequent need for the compulsory introduction of science into the training college. Now by contrasting the expenditure of the training colleges for tuition in 1857, when algebra, higher mathematics, industrial mechanics, and physical science were carefully taught therein, with the expenditure of the same colleges in 1867, with a course of study that would not qualify the student to pass the honours' examination for juniors in either of the universities local examinations, it will be seen that the re-introduction of scientific instruction would not entail any additional expenditure for tuition. In the following table I have inserted the colleges whose expenditure for tuition is given in the minutes of the Committee of Council for the years 1857 and 1867:—

	1857.			1867.		
	£	s.	d.	£	s.	d.
Battersea .....	1,334	0	0	1,075	0	0
Carnarvon .....	495	4	0	440	0	0
Carmarthen .....	540	0	0	446	0	0
Chelsea .....	1,435	0	0	1,275	0	0
Cheltenham .....	1,051	16	0	1,415	0	0
Chester .....	598	0	0	630	0	0
Durham .....	72	9	3	667	19	1
Exeter .....	424	4	0	639	4	0
Culham .....	560	0	0	732	15	0
Winchester .....	430	0	0	447	15	3
Saltley .....	546	0	0	1,207	0	10
Total .....	7,486	13	3	7,975	14	2

The gross amount of expenditure for tuition for a lower standard of attainments is not only greater in

1867 than in 1857, but the number of students has considerably diminished. In 1857 there were in the above colleges 640 students, in 1867, 512; the average cost for tuition has thus increased from £11 10s. per student to £15 10s. ditto. It is therefore evident that no financial difficulty interferes to hinder the replacement of scientific instruction in the course of study prescribed by the Committee of Council for Normal Students.

So far then as relates to the provision of duly qualified science teachers for elementary schools and for the ordinary evening science classes, the training colleges could, without additional outlay, by a simple adjustment of the teaching staff, meet present requirements. But the training colleges are not more than half filled with students, and as the supply of trained teachers is equal to the demand, should accommodation afforded by them be left unused, or could it, without interference with the primary object of the colleges, be made available for the purposes of higher scientific education until such time as central science colleges become national institutions?

A course of study ranging over two years might be arranged, whereby private students, the sons of manufacturers, and heads of factories, might obtain a higher scientific education, similar to that given in the Continental Polytechnic Schools. A portion of this course would be available for the students in training for the masterships of elementary schools, who, so far as that portion is concerned, would receive their lessons in common with the private science students.

The course of study pursued at the Royal Polytechnic School at Munich, and the Polytechnic School at Nuremberg, fairly indicates a course that might be introduced into our training colleges. The instruction in these schools is distributed over a period of three years, arranged as follows:—

#### FIRST COURSE.

Mathematics, viz., trigonometry, analytical geometry, &c.  
Physics, viz., gravity, light, heat, electricity, &c.  
Machine drawing.  
Descriptive geometry.  
Ornamental drawing.

#### SECOND COURSE.

Analytical mechanics, viz., statics and dynamics of solid bodies.  
Machine drawing.  
Chemistry, pure and applied.  
Differential and integral calculus.  
The doctrine of construction in building and building materials.

#### THIRD COURSE.

Applied mechanics.  
Machine drawing.  
Analytical chemistry.  
Composition in the art of building.

In the introduction of a similar scheme of technical education into the training colleges, no elaborate preparation or expense is required. The principal colleges have already laboratories connected with them, and are also fairly supplied with scientific apparatus. The present annual outlay for tuition added to the Government science grant for the ordinary students in training, who all come under the departmental regulation of poor students, is sufficient to include the remuneration of competent scientific professors. It must also be borne in mind that the private science students would entail no expense upon the authorities of the colleges, for the cost of maintenance and tuition would either be defrayed by the students themselves, or from the proceeds of scholarships other than those now attached to the colleges. The present total annual cost for tuition, board, lodging, and permanent establishment charges, averages £57 per student. I have already shown that almost the whole of this amount is defrayed by the State. As nearly one-

third of the total cost is expended in tuition and other expenses of instruction, which would not be increased by an enlarged number of students, it follows that the cost per head for the maintenance and instruction of the private science students would be less than the present average cost per normal student.

Here, then, by the adaptation and extension of present means, may be provided high scientific instruction for a class now without due provision. Board, lodging, and appliances for instruction are all ready to hand; and it only remains for the Committee of Council—by whose grant the training colleges are now maintained, and to whom the country is looking for initiatory measures for the further promotion of scientific instruction—to make such regulations as shall render these institutions available as science colleges, and at the same time justify the enormous grant now annually made for their support.

It is unnecessary, for any practical purpose, to extend the subject under consideration any further at present. Notwithstanding all that has been said respecting the need for advanced scientific instruction, it is unmistakably evident that there is not yet a science constituency ready to take advantage of more elaborate means for technical education. Twelve months since Dr. Lyon Playfair, speaking in this room on the establishment of advanced technical schools, said—"These technical schools will not be fed unless we spread a taste for science and art. We have got some of them at present. There is an admirable technical school in Jermyn-street, the School of Mines, but the number of its matriculated students is very small; not from any want of efficiency in the conductors—the professors are of the highest position, and its education is excellent—but the large field of mining industry cannot supply twenty men capable of receiving the systematic instruction which is there given. We want, before we found these technical schools, to create the taste, and then our technical schools will be well filled." Professor Huxley, on the same subject, remarked that the smallness of the attendance did not arise from any defect in the teaching, but "it was because the great mass of the manufacturing interest did not, even at the present moment, understand that such instruction in the groundwork of technical knowledge was what they wanted to prevent their manufactures from going to ruin."

Because my daily experience confirms these statements, I have restricted my remarks to the adaptation and extension of present means for scientific instruction, trusting that, by the concentration of action thereupon, a taste for scientific knowledge may be generated in the great mass of the population, so that our successors may have prepared for them a body of students willing and able to avail themselves of the best means for the advancement of technical education.

#### DISCUSSION.

Mr. F. S. POWELL quite agreed with the observation made in the paper that one of the great difficulties at present was the formation of what was termed a science constituency. It was impossible for anyone who had watched the progress of educational measures in the House of Commons and elsewhere, not to be aware of the fact that, when there had appeared a desire on the part of the Government to advance, before many years had elapsed the current had set in the opposite direction. He thought, however, that rather too gloomy a view had been taken of the operations and results of primary schools, and although it was based on the reports of the inspectors, he thought very possibly other passages in those reports might be found which would tend to greatly brighten the picture. He hoped the friends of education would make it more of a practice to visit these primary schools, and judge for themselves of the quality of work which was accomplished therein; but in relation to the results, the influences under which the children were placed at home should always be borne in mind. It was very easy to say

that the meaning of ordinary words and phrases was not understood, but they must recollect that expressions in ordinary use amongst educated people were seldom heard and never used by the parents of these children. It would require at least one generation, when the children now being educated should have grown up and had children of their own, before much progress could be expected in the general education of the country. He did not wish to enter into the question of how many children there were at present under instruction, though he believed the proportion was not so unsatisfactory as was often supposed, but the main object should be to raise the standard and quality of the education which was provided. The *Pall-mall Gazette* of that evening contained some statements taken from the Report of the Council on Military Education, just issued, from which it appeared that out of a total number of men in the army of 169,214, 135,280 were able to read and write, while 10,357 were described as having a superior education; and not long since it had been stated in the House of Commons, by an officer in the Guards, that only two or three men in his battalion were unable to read and write. With regard to the Revised Code, it was undoubtedly the fact that in some respects it had acted prejudicially on education. It might be fairly described as having cut off the tops of the plants, and whether it had given greater vigour to the roots was an open question. Having been a member of the committee of the House of Commons which had recently sat on the subject of technical education, he might say a word or two on that point. The substance of the evidence given, both by employers and intelligent workmen, was, that the system hitherto chiefly pursued in English arts and manufactures was that vulgarly known as the rule of thumb, and that if the same thing were allowed to continue we should fall behind other nations, who were much better provided with scientific education. One of the witnesses examined was a man who had spent a considerable portion of his time in America, and he stated that the great difference between the British and American workman was that the former generally seemed jealous of his master, while the latter did all in his power to co-operate with and advance his interests. That statement might or might not be true in its full extent, but at any rate, if they were to teach the English workman to co-operate with his employer, one of the first steps must be to give him a practical scientific education. Being on the Council of St. Mark's Training College, he was in a position to say that Mr. Sales was not quite correct in saying that Government bore all the expense of these institutions, for, in fact, Government assistance was limited to 75 per cent. of the total amount, and the apparently high cost per student was partially accounted for by the fact that at present these institutions were not nearly filled. The reason why the course of instruction had been limited was that complaints were made that the teachers of national schools were receiving, at the public expense, too high an education, and quotations were given in the newspapers from the examination papers. The result was that the course of study was restricted, which he, for one, very much regretted. He had lately had the honour of introducing to the Lord President of the Council a deputation of Church schoolmasters, who desired that a higher education should be afforded in these training colleges, and that those who had profited by it should be able to exercise their talents in middle-class education, and he sincerely hoped that these desires would be accorded to.

Mr. PATERSON could not agree in the view that they must wait for the next generation to see any great results from improved education; before that time the present means, which were the subject of the paper, might probably be replaced by others, and if we were to keep our place in the commerce of the world, we must do something immediately. He was himself a workman, and consequently knew the feelings of working men, and he

believed that a great deal of the so-called failure to introduce scientific education amongst this class of the population had arisen from not taking into account their wishes and circumstances. Taking for illustration the School of Mines, in Jermyn-street, it was said that with regard to the system of instruction, and high character of the professors connected with it, it would bear comparison with any institution in the world, but that the number of students was very small. The reason was that the instruction was given at a time when working men could not attend, and at a cost which working men could not afford. An experiment of a popular kind had been tried there, courses of evening lectures being given at the cost of sixpence for the course, and the result was that at the time when the tickets were to be obtained the rush was similar to that at the door of a theatre on the first night of a new drama; and he had known instances of individuals who had not been able to attend or get tickets purchasing them at a high premium from those who had been more fortunate. If the same facilities were afforded on a larger scale, it would be found that amongst the working classes there was a very large constituency who were desirous of obtaining scientific instruction, and every one of these would act as a missionary in spreading the desire for knowledge among his fellows. There was no doubt that the excellence of foreign workmanship, especially in some particular branches, was owing in great part to the superior education of the foreign workmen, though he believed this was often over estimated, but the fault did not lie altogether with the English workman. It had been said that in many instances Mechanics' Institutions had proved failures, but this very often happened because the instruction afforded was not by any means up to the mark. From his own experience, he was able to say that the London Mechanics' Institution, so long as its founder, Dr. Birkbeck, was able to give his personal attention to it, was thoroughly appreciated by working men; and it was not until the quality of the instruction deteriorated that the attendance fell off. If such institutions as that in Jermyn-street could be popularised and multiplied throughout the country, he was satisfied that they would be well supported; or at any rate the influence of those who appreciated their advantages would soon leaven the body to which they belonged. With regard to the education of children, it would always be difficult to carry it beyond that point which the parent considered desirable, and therefore adult education must go hand-in-hand with that of the rising generation. He might mention, in conclusion, that at a meeting of working men, held not long ago, a committee had been appointed for the purpose of carrying out a system of technical instruction; a similar committee had been formed at Birmingham, which already had four science classes at work, and before long he believed there would be a similar committee in every large town in the kingdom. When this was the case, it could not be said that there was no demand for scientific instruction.

Mr. E. A. DAVIDSON had been much pleased in listening to a paper of so practical a character, though it would not become him to say much in its praise, inasmuch as he had himself expressed much the same views in the paper which he read in the same place in the month of December, 1867, particularly with regard to the use which might be made of the training colleges. In order, however, to make any general and lasting impression on the education of the country, they must begin at the beginning, with the national schools. He believed that one great cause of the diminution in the number of students at the training colleges was the pupil-teacher system, which became so general, simply because it enabled the schoolmaster to earn a living. There was no reason why the rudiments of natural science should not be taught in national schools, provided it were done in a practical manner. According to the returns of the Science and Art Department, 29 science schools had failed during the past year; and he maintained that the principal cause was a want of interest,

not in those who were to be taught, but in those who were to form the managing boards and conduct these science classes, and thus proper advantage was not taken of the facilities offered by the Department. If this apathy continued there could be no doubt that the prophecy would soon be realised, that foreign nations would outstrip England in arts and manufactures. It must not, however, be supposed that the want of scientific instruction was confined to working men; there was the same need amongst all classes, from the highest to the lowest—from the university even to the ragged school.

Mr. SHAW (Burnley) said that as a practical science teacher he had visited the French Exhibition of 1867, with a view of making a report to the Science and Art Department; in that report were included recommendations that the science teaching, which, since the introduction of the Revised Code, had been discontinued in elementary schools, should be re-established; that science should be taught in training colleges; and that schools should be established on the plan of the Bristol Trade School. He was at present engaged in the East Lancashire Union of Institutions, having under his superintendence, more or less directly, 3,000 evening scholars, whilst he had the immediate care of 14 science classes, numbering from 200 to 250 pupils. The result of his experience was that there was a great lack not only of scientific or technical education, but also of elementary, for he found that many of the young men attending the evening classes were anxious to become acquainted with various departments of natural science, but were prevented for want of elementary knowledge. If, therefore, they wanted a sound system of education, they must begin with the day school; and if only the bare rudiments of natural science were therein communicated, the science teacher in his evening classes would have an opportunity of extending his course of instruction far beyond what was at present possible. The evil results of the Revised Code could be easily shown in this way: before its introduction there was a regulation under which teachers of primary schools could obtain what was called "apparatus grants," for the purpose of teaching various branches of science, and the result was that in many schools might be found a small chemical laboratory, a collection of physical apparatus, or of natural history specimens. All this was swept away by the Revised Code, and when, in 1868, the Science and Art Department offered prizes of certain scholarships for pupils in primary schools who passed a prescribed examination in such subjects, it was found that the machinery which would have created students eligible for these prizes had been destroyed. He hoped Mr. Sales's views with regard to the training colleges would be carried out, and from a somewhat lengthened experience in connection with evening classes, he believed it was almost impossible to estimate the benefit which would arise from a general diffusion of scientific knowledge by their means.

Mr. THOMAS N. DAY was much pleased to find both the paper and the discussion so practical in character. This subject had been under discussion for the last 20 years, and as yet little progress had been made, as he believed, because they had not begun at the right end. It was all very well to say that working men should have scientific instruction—so they should, but no general improvement would be effected in that way unless the rising generation were properly educated. Some years ago things appeared to be taking a more favourable turn, but the Revised Code came in and spoiled all. Before that time schoolmasters endeavoured to give their pupils an education, but it was not so now; they gave a mere mechanical drilling in those subjects which were paid for. Reading, writing, and arithmetic did not constitute education, which meant the development of the intellectual powers. Nothing was more fallacious and misleading than statistics as to the number who could read and write; children might pass that test, and yet have no taste at all, but rather a dislike for further instruction, and this was

the tendency of the Revised Code, unless the teacher rose above it. He was not so foolish as to want to teach science to children under twelve years of age, for, as a general rule, until about that age, although the memory might be stocked, the reasoning faculties were not capable of exercise, but in every primary school there should be an upper class for those who remained beyond that age, who should be taught the rudiments at least of natural science. He should be sorry to see the training colleges diverted from their original purpose, because he believed there was quite work enough for them in training teachers for elementary schools. The whole principle of the Revised Code, payment by results, he believed to be absurd. Could anything be more ridiculous than to complain that schoolmasters were being over-educated, or, as was said by Mr. Lowe, that it was not necessary for men with any ambition to enter the profession? He hoped and believed that the meeting would be unanimously of opinion that if scientific instruction was to make any satisfactory progress, it must be taught to the upper classes in all elementary schools.

Admiral OMMANEE, F.R.S., would like to know whether the school inspectors were men of any scientific knowledge. He feared that the contrary was the case, generally speaking, many of the inspectors being clergymen who were not familiar with science. He had listened to the paper with great pleasure, and concurred in the suggestions which it contained, but he hoped the point he had referred to would not be forgotten in future appointments.

The CHAIRMAN said he could not entirely pass by the remarks which had been made during the discussion, lest it might be supposed that he agreed with all that had been said, for, on the contrary, he could not by any means concur in the total condemnation of the Revised Code, which seemed the general feeling of the meeting. It was quite possible that improvements might be made in it, but it must be remembered that it came into operation after one of the ablest commissions that ever inquired into any subject had reported that a very large proportion of the children who attended the elementary schools, assisted by Government, left at the age of ten years with scarcely any knowledge of reading, writing, or arithmetic. Government thereupon determined, as he believed, with great propriety, that they would no longer pay for such children, and that whatever might be taught, no school should receive assistance which did not produce some practical results in the way of these absolutely necessary branches of knowledge. He contended, therefore, that in principle the Revised Code was right, though he should like to see some better provision made for teaching elementary science to the more promising scholars who remained longer at school. Having been, with Mr. Powell, a member of the Committee of the House of Commons which inquired into the subject of technical instruction, he was able to state, on the authority of Professor Tyndall, who had carefully examined the papers of those who had passed the examination of the Department in connection with evening classes and Mechanics' Institutes, that the amount of knowledge acquired by the students was really such as would be of practical benefit to them, and he believed it was to these means they must look for really diffusing scientific instruction. At the same time he admitted that this was not enough; there were a certain number of youths of more than average abilities, whose desire for knowledge could not be satisfied with mere evening instruction, and he believed the right way to provide for them was that which Mr. Sales had briefly alluded to, viz., restoring the endowed grammar schools to the purposes for which they were originally intended. That question was now being grappled with by a gentleman who was not likely to fail for want of energy—his friend Mr. Forster—who, acting upon the recommendations of the Middle Class Schools Inquiry Commission, had brought in a measure which, if it could only be passed in the face of the strong opposition which it would

be certain to encounter, would do more good in this matter than could be anticipated. He proposed that a small paid commission should give their entire time and attention to this subject, having unlimited power under the sanction of Parliament and the Privy Council, to re-arrange the whole of the endowed grammar schools, and he hoped many would be re-arranged somewhat on the model of the Bristol Trade School, to which allusion had been made; whilst the many small endowments which were now absolutely useless might be converted into exhibitions to be given to those promising lads who should pass the requisite examination. By this means he hoped provision would be made for so educating their future Stephensons that their country might receive the full benefit of their talents. In conclusion, he proposed a vote of thanks to Mr. Sales for his able and interesting paper.

The vote of thanks having been carried unanimously,

Mr. SALES said he had hardly any observations to offer in reply, inasmuch as the whole of the criticisms had been of a favourable character. He might say, in reference to what fell from Mr. Powell, whom he claimed as a colleague in the good work, that his (Mr. Sales's) statements as to the results of elementary teaching were taken from sources which ought to be trustworthy—Her Majesty's inspectors and the schoolmasters themselves—and if he had exaggerated the amount of Government support given to the training colleges, he had been led astray by the figures in the Blue Book, which gave the amount of Government assistance at £32,000, as against a total of £40,000. His object had been, not to introduce any new scheme, but to point out how existing means might be utilised; and he would again express his opinion, that to do any general and lasting good they must begin at the beginning, and teach the alphabet of scientific knowledge in all elementary schools. His principal fear was that while they were arriving at and planning some grand educational edifice for carrying on scientific instruction, the absolute present necessities of those who were to inhabit it would be overlooked. As a practical man, he believed the best thing was for all to put their shoulders to the wheel, and make the best of existing means.

### Fine Arts.

**GREAT ART PRIZE IN FRANCE.**—In the month of August is to take place the first award of the great prize of 100,000 francs, instituted by the Emperor Napoleon III., to be voted by the Academy of the Beaux Arts and the Institute of France to the French artist, painter, sculptor, or architect who shall have produced, and entirely completed within the five years preceding the time of the award, a work of great excellence. The jury is to consist of thirty members—ten sculptors, ten painters, and ten architects. In case any of the members of this jury should become candidates for the prize they will retire from it, and their places will be filled up by the Academy.

### Manufactures.

**MANUFACTURE OF BEADS AT VENICE.**—The value of the exports of glass beads from Venice during 1868 were as follows:—To Bombay, Calcutta, Singapore, to the value of 1,860,000 francs; England, 1,470,000 francs; Zanibar and eastern coast of Africa, 650,000 francs; North America, 570,000 francs; Germany, Denmark, and Sweden, 560,000 francs; West Coast of Africa, 520,000 francs; France, Belgium, and Holland, 467,000 francs; South America, 430,000 francs; Constantinople and the Black Sea, 425,000 francs; Egypt, Tripoli, and Morocco, 375,000 francs; Russia, 280,000 francs; Italy, 78,000 francs; Spain and Portugal, 75,000 francs; Java

and Sumatra, 70,000 francs; making a total value of 7,830,000 francs (£313,200).

**EXPORTS AND IMPORTS OF MACHINERY IN THE ZOLLVEREIN.**—Amongst the industries which, during the last twenty years, have made the greatest progress in the Zollverein, the construction of machinery, perhaps, is the most important. Formerly all the steam-engines were imported into these states, principally from England, the United States, and Belgium; now a large quantity of machinery is not only made in the Zollverein, but exported to other countries. The following are the exports and imports of machinery in 1866 as compared with those of 1867:—

	Exports.	Imports.
1866 ....	144,157 cwt. ....	226,045 cwt.
1867 ....	209,129 „ ....	226,914 „

The imports of locomotives, tenders, and boilers in 1867 amounted to 25,599 cwt., of which 13,901 cwt. were imported from Austria, 3,464 cwt. from France, 4,948 cwt. from England, and 1,430 from the Netherlands. The exports of this class of machinery during the same year were 42,648 cwt. to the Netherlands, Russia, France, Belgium, and Austria. The imports of machinery constructed chiefly of wood amounted to 22,069 cwt. from Holland, Switzerland, England, France, and Belgium; and 14,678 cwt. were exported principally to Austria, Russia, Holland, and Belgium. The largest trade was done in machines consisting principally of cast-iron, the imports being 146,476 cwt. from Switzerland, England, France, Belgium, Holland, and Austria, against 110,895 cwt. exported to Russia, Austria, Switzerland, Holland, Belgium, and France. Machinery of wrought-iron and steel, amounted to 31,156 cwt. imported from Holland, England, Belgium, and Switzerland, and 30,382 cwt. exported to Austria, Russia, Hamburg, and Belgium. The imports of machinery made of other metals amounted to 1,614 cwt., against an exportation of 9,526 cwt.

### Commerce.

**SHIPPING AT PALERMO.**—The number of ships belonging to the maritime division of Palermo at the beginning of the present year was as follows:—

	No.	Tonnage.
Sailing vessels .....	1,311 .....	19,616
Steam vessels, screw or paddle .....	16 .....	5,042
Lighters and vessels for harbour purposes ..	574 .....	1,978
Total .....	1,901 .....	26,636

The movement of shipping in the port of Palermo during 1868 was:—

	No.	Tonnage.
Arrivals .....	37,04 .....	511,520
Departures .....	35,44 .....	512,921

Total .... 7,248 1,024,441

**RAILWAYS IN SWITZERLAND.**—The following are the kilometrical receipts of the principal Swiss lines during 1868, as compared with those of the previous year:—

	1867. Frs.	1868. Frs.
Railways.		
Western Swiss .....	18,459 ..	19,024
United Swiss .....	14,025 ..	14,314
Central Swiss .....	28,030 ..	29,838
Bernese .....	9,563 ..	10,070
Ligne d'Italie .....	6,325 ..	6,080
Zurich and Lucerne .....	11,332 ..	12,159
Jura Industrial .....	13,891 ..	14,503
Bülach and Regensberg ..	3,840 ..	4,298
Bulle and Romont .....	— ..	6,780
Average .....	19,254 ..	20,340

## Colonies.

**STATE OF AGRICULTURE IN NEW SOUTH WALES.**—Considerable attention is now being paid in this colony to the statistics of agriculture, and at a meeting of the Royal Society of New South Wales Mr. Christopher Rolleston read a paper on the results of wheat culture in the colony during the last ten years. Mr. Rolleston divided the colony into five districts—southern, western, northern, midland, and pastoral, and gave the number of acres under cultivation, the yield per acre, the value per bushel, and compared the results of the successive periods. He found that in the first five of the past ten years there was an annual breadth of land laid down in wheat for grain of 114,204 acres, with an average yield of 1,482,998 bushels, being at the rate of 13 bushels per acre, whilst in the second five years the average annual breadth of land laid down in wheat for grain was 132,864 acres, with an average yield of 1,345,814 bushels, being at the rate of 10 bushels to the acre. Such results were not encouraging to the prosecution of this branch of agriculture, but he showed that, in 1867, there was a considerable increase upon the average of the previous five years, the average yield being rather under 12½ bushels. In Cumberland and the Northern districts there had been such a diminution of the yearly produce of wheat as to lead to the conclusion that these districts would prove unsuited to wheat culture, while the returns from the West and Southern districts were such as to warrant the expectation of large and permanent supplies of wheat from those districts. There is no doubt that the latter circumstance is caused by the increased facilities which the progress of the railway lines offers to the producers to bring their grain to market. But, notwithstanding the palpable decadence as exhibited by the return from the North, it is satisfactory to learn that the harvest prospects of these districts are so promising as to lead to the assumption that prices of foreign importation will be materially affected.

## Notes.

**ACADEMY OF INSCRIPTIONS, PARIS.**—M. Max Muller, of Oxford, has been elected a Foreign Associate of this Academy in place of the late M. Welcker, of Bonn.

**EMIGRATION FROM EUROPE IN 1867.**—According to the statistics published by the Bavarian Government, it appears that the number of emigrants that left Europe in 1867 was 242,025, of which nearly half were from Germany. The following show the number of emigrants from each country:—Germany, 117,591; Ireland, 65,134; England, 33,712; Scotland, 6,315; Sweden, 4,843; Switzerland, 3,985; France, 3,204; Holland, 2,156; Belgium, 1,623; Denmark, 1,372; Italy, 1,032; Norway, 309; Poland, 268; Spain, 203; Russia, 185; Portugal, 79; Greece, 8; Turkey, 6.—Total, 242,025. The greatest emigration was to the United States; and the preference was given to the Bremen and Hamburg routes to those *à la* Havre, Liverpool, or Antwerp. The number of Bavarian subjects that emigrated in 1867 was 3,294, taking with them capital and outfits to the value of 1,116,000 florins.

## Correspondence.

**PORPOISE OIL.**—**SIR,**—The Society of Arts, it appears by the *Gentleman's Magazine* for 1799—offered one premium of thirty pounds for the greatest number of porpoises, not less than 30, which might be taken on the British coasts before the end of that year. This Society also offered a similar premium for the manufacturing of the greatest quantity of oil from porpoises taken on the

same coasts in that year, not less than 30 tons, and an additional premium of £15 for not less than 15 tons of oil so extracted. But these premiums were offered before the valuable discovery of gas, in lieu of oil, and it might not now be desirable to encourage the destruction of porpoises for their oil, nor to expend public money towards decreasing the number of bottle-nosed whales, according to the plan recently suggested in letters sent to the Board of Trade, and published in the *Times*, &c.—**I am, &c.,** CHAS. COOKE.  
London, February 19th, 1869.

## MEETINGS FOR THE ENSUING WEEK.

- MON.....**R. Geographical, 8½. 1. Dr. W. A. Bell, "On the Colorado and Great Basins of North America." 2. Mr. R. Brown, "On the Formation of Fjords, Canons, and River Terraces."  
Medical, 8.  
Victoria Inst., 6.  
London Inst., 6.  
**TUES ...**R. Medical and Chirurgical, 8½.  
Civil Engineers, 8. Mr. Zerah Colburn, "American Locomotives and Rolling Stock."  
Photographic, 8.  
Ethnological, 8½. Special Meeting on "The Ethnology and Archaeology of India."  
Royal Inst., 3. Rev. F. W. Farrar, "On Comparative Philology."  
**WED ...**Society of Arts, 8. Mr. N. P. Burgh, "On the Screw Propeller."  
Geological, 8. 1. Mr. J. W. Judd, "On the Origin of the Northampton Sands." 2. Mr. M. H. Coquand, "On the Cretaceous Strata of England, France, and Algeria." Communicated by Mr. J. W. Flower.  
Graphic, 8.  
Microscopical, 8. 1. Mr. George Gulliver, "On the Fibres of the Crystalline Lens." 2. Mr. Alfred Sanders, "On Zoospores of Crustacea."  
R. Literary Fund, 2. Annual Meeting.  
Archæological Assoc., 8.  
**THUR ...**Royal, 8½.  
Antiquaries, 8½.  
Zoological, 8½.  
London Inst., 6.  
Royal Society Club, 6.  
Mathematical, 8.  
Society of Fine Arts, 8. Exhibition of Works of Art. A Paper by Mr. Henry Tidey.  
**FRI .....**Astronomical, 8.  
Royal Inst., 8. Prof. Abel, "On Naval and Military Applications of Electricity."  
**SAT .....**R. Botanic, 3½.  
Royal Inst., 3. Prof. Odling, "Hydrogen and its Analogues."

## PARLIAMENTARY REPORTS.

### SESSIONAL PRINTED PAPERS.

*Delivered on 20th February, 1869.*

- Par.**  
**Numb.**  
1. Bill—Contagious Diseases (Animals).  
4. " Hypothec Abolition (Scotland).  
2. (4.) Railways Abandonment—Warrant.  
6. Public Works (Manufacturing Districts Acts, 1863-64)—Report.  
13. Treasury Board—Treasury Minute.  
Telegraphic Communication (Europe and India)—Convention.  
Oyster and Mussel Fisheries (France)—Report.  
Railways (Ireland)—Second Report of Commissioners.

*Delivered on 22nd February, 1869.*

2. Bill—Admiralty Jurisdiction (County Courts).  
5. " Sunday Trading.

*Delivered on 23rd February, 1869.*

7. Bill—Election Expenses.  
8. " East India Irrigation and Canal Company.  
9. " County Courts Proceedings.  
4. Post Office (Brazil and River Plate Mails)—Contract.  
10. Unions, Pauperism, &c. (Metropolis)—Return.  
22. Police (Counties and Boroughs)—Reports.  
25. Charitable Funds—Return.

*Session 1868.*

344. (A VII.) Poor Rates and Pauperism—Return (A).  
501. Navy (Turret Ships)—Opinions of Naval Officers.

*Delivered on 24th February, 1869.*

13. Bill—Ecclesiastical Titles.  
14. " Revenue Officers.  
3. National Gallery—Annual Report.  
14. Military Reserve Funds—Account.  
Manufactures, Commerce, &c.—Reports by Her Majesty's Secretaries of Embassy and Legation (No. 1, 1869).  
Public Petitions—First Report.

- Delivered on 25th February, 1869.*
- 6. Bill—Party Processions (Ireland).
  - 10. „ Permissive Prohibitory Liquor.
  - 14. „ Revenue Officers (corrected copy).
  - 16. „ Money Laws (Ireland).
  - 15. Irish Reproductive Loan Fund—Accounts.
  - 38. Civil Services—Supplementary Estimate.

- Delivered on 26th February, 1869.*
- 18. Bill—Poor Law (Ireland) Amendment.
  - 27. Drogheda Election—Minutes of Evidence.

- Delivered on 27th February, 1869.*
- 19. Bill—Annuity Tax (Edinburgh).
  - 17. Army (Manufacturing Departments)—Return.
  - 20. East India (Revenues)—Return.
  - 21. East India (Loan)—Return.
  - 40. Navy—Estimates.
  - Naturalisation and Allegiance—Report of the Commissioners.
  - Public Petitions—Second Report.

- Delivered on 1st March, 1869.*
- 17. Bill—Libel.
  - 5. Dublin Port and Docks Bill—Report of the Board of Trade.
  - 8. Norwich Election—Minutes of Evidence.
  - 9. Bewdley Election—Minutes of Evidence.
  - 28. Bradford Election—Minutes of Evidence.
  - 39. Army—Estimates.
  - 41. Army (Variation of Numbers, &c.)—Statement.
  - 42. Army (Colonies)—Statement.

## Patents.

*From Commissioners of Patents' Journal, February 26.*

### GRANTS OF PROVISIONAL PROTECTION.

- Adhesive stamps—485—W. E. Newton.
- Animal substances, &c., preserving—469—L. N. Legras.
- Artificial leather—477—F. Walton.
- Beer, &c., apparatus for preserving, &c.—381—L. Strauss and A. Seckbach.
- Benzole, &c., obtaining—488—W. R. Lake.
- Boats, righting when upset at sea—295—K. C. Watson.
- Boilers—401—G. F. G. Desvignes.
- Boots—436—T. A. Collinson.
- Boots and shoes—463—S. Shaw.
- Boots and shoes, cutting to shape the soles and heels for—395—J. and G. W. Dennell.
- Bottles, cases for packing—445—W. Summers.
- Brewers' vats, &c., metallic bungs for—470—V. A. Houdaille.
- Brick-making machinery—472—B. J. B. Mills.
- Bricks, &c.—331—F. Vauderaey.
- Broughams, &c.—478—H. Mulliner.
- Carriage wheels—475—A. McNelle and J. Slater.
- Carriages—441—G. H. Morgan.
- Carriages, &c., bearing springs of—359—W. Adams & W. G. Beattie.
- Casks, machinery employed in constructing—464—T. Bond.
- Clipping and shearing apparatus—369—J. S. Offord.
- Cloths, double texture—418—G. Broadhurst and J. Kershaw.
- Cocks, taps, and valves—371—R. Snook.
- Copper, extracting from its ores—460—A. H. Lewis.
- Corn, seed, and manure drills—377—T. Harrison.
- Damasks, &c.—253—H. Barcroft.
- Ejector condensers—456—A. Morton.
- Electro-magnetic apparatus—391—W. A. Lyttle.
- Explosive compounds—442—W. E. Newton.
- Fans—389—H. J. Richman.
- Fire-arms, breech-loading—446—C. Gordon.
- Fluids, &c., vessels for warming, &c.—484—E. Round.
- Food, preserved—434—H. Edwards.
- Furnaces—341—T. Parkinson.
- Furnaces—345—E. Lord.
- Furnaces—476—J. Fletcher.
- Furnaces of gas retorts—444—F. C. Hills.
- Gases, &c., measuring the pressure of—429—J. Young.
- Glass, &c., producing designs on—393—G. Rees.
- Gully traps—344—T. Pankhurst, sen., and T. Pankhurst, jun.
- Harness buckle and loop combined—457—W. H. Taylor.
- Heating apparatus—449—W. E. Newton.
- Heating and ventilating apparatus—403—J. H. Johnson.
- Horses, &c., apparatus for giving medicines, &c., to—373—J. T. Edmonds.
- Knitting machines—387—W. R. Lake.
- Locks for bags, &c.—415—F. J. Knewstubb.
- Looms—438—W. H. Hayhurst.
- Looms—458—W. R. Lake.
- Metallic bedsteads, &c.—483—J. Atkins.
- Metallic tiles for roofing purposes—399—L. A. C. St. Paul de Sinçay.
- Mules for spinning yarns—363—A. Clark.
- Muslins, &c., stretching, &c.—347—R. W. Knowles and G. Green.
- Nets for ladies' hair—467—T. Billyeald.
- Ordnance, mounting and working—361—J. H. Johnson.
- Paper fasteners—353—G. and E. Ashworth.
- Photographing printing process—417—W. H. Fischer.
- Photographs—395—O. Sarony.

- Pianofortes—427—P. J., F. W., & H. G. Smith & A. Pappenberger.
- Ploughs—339—J. Howard.
- Ploughs—450—D. Hanton.
- Pumps—411—S. Mellor.
- Purses, &c., fastening for—466—H. Posen.
- Railway carriages—325—J. Slater.
- Railway chairs—435—W. J. Horton.
- Railways—466—F. H. Collins.
- Reaping machines—431—C. Thomas.
- Rocking chairs, &c.—400—G. Critchley and H. B. Fox.
- Rotary engines—443—A. V. Newton.
- Saccharine solutions, &c., filtering—333—W. Lister.
- Sash holders—448—J. Holmes.
- Saws—455—B. Hunt.
- Screw propellers—440—T. V. Trew.
- Seed and manure drills—452—S. W. Campain.
- Signal bells—380—T. Nichols and J. Parr.
- Spades, shovels, &c.—479—J. W. Yates.
- Spindles and flyers—461—T. Hattersley.
- Spring bedsteads—474—H. Tylor.
- Spring couplings—465—T. Winder.
- Stamps for printing on paper, &c.—367—C. S. Dawson.
- Steam engines—405—E. J. A. Camere.
- Steam engines—481—J. B., and R. Wood.
- Stearic and oleic acids—419—P. Taysen.
- Steel—3965—A. G. Cazalat.
- Sulphate of iron, utilising the waste solution of—355—F. Braby.
- Surgical bandages—413—S. W. Mulloney.
- Timber, finishing the surfaces of—242—J. Pickering.
- Tin andterne plates—319—E. Morewood.
- Washing machines—482—E. T. Hughes.
- Waterclosets—423—J. Carter.
- Water velocipedes—425—W. R. Lake.
- Wheaten flour—489—H. D. Bowyer and J. L. Norton.
- Wood-cutting machinery—487—A. Ransome.
- Wool, &c.—273—J. Box.
- Wool, &c., operating on fibres in machinery for combing—409—J. Crofts.
- Wool, &c., treating the waste of—473—C. E. Brooman.
- Wrought-iron—337—L. Wray.

### INVENTION WITH COMPLETE SPECIFICATION FILED.

- Despatch cases, &c., fittings for—491—F. J. Knewstubb.

### PATENTS SEALED.

- |                                   |  |
|-----------------------------------|--|
| 2661. E. Peyton.                  | 2777. A. M. Clark.                     |
| 2663. D. Smith.                   | 2781. J. Shand.                        |
| 2668. G. Ker.                     | 2795. W. R. Lake.                      |
| 2670. B. Corcoran & W. Dunham.    | 2796. A. C. Henderson.                 |
| 2674. E. Richardson.              | 2864. A. F. Campbell.                  |
| 2700. W. C. Holmes.               | 2910. W. H. J. Grout.                  |
| 2703. E. Jobson.                  | 3227. W. K. Foster.                    |
| 2704. W. R. Lake.                 | 3233. G. T. Bousfield.                 |
| 2708. J. Adams and H. Barrett.    | 3311. G. T. Bousfield.                 |
| 2713. J. Evans.                   | 3513. H. D. Hoskold and G. P. Wheeler. |
| 2714. J. I. Campbell.             | 3528. B. Britten.                      |
| 2715. T. Forster & J. Heartfield. | 3534. C. Descat and H. Guillaume.      |
| 2744. T. Wilson.                  | 3565. C. D. Abel.                      |
| 2761. J. Jones.                   |  |
| 2773. E. Johnson.                 |  |

*From Commissioners of Patents' Journal, March 2.*

### PATENTS SEALED.

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|---|--|
| 2579. D. Martin, W. Small, A. Hutton, and A. Key. | 2793. J. Oliver & C. O. McAllum.                     |
| 2720. J. Griffiths.                               | 2809. M. Henry.                                      |
| 2724. S. Grafton.                                 | 2828. A. M. Clark.                                   |
| 2728. D. Jones.                                   | 2832. E. Sarjeant.                                   |
| 2737. J. Pickering.                               | 2861. J. Davey.                                      |
| 2749. H. M. Lee.                                  | 2863. W. E. Newton.                                  |
| 2752. G. Davies.                                  | 3032. D. West.                                       |
| 2753. W. T. Carrington.                           | 3105. J. C. Morgan, II. Macaulay, and F. W. v. aide. |
| 2770. T. E. Clarke.                               | 3113. R. Tod.  |
| 2774. J. Millward.                                | 3425. M. H. Davies.                                  |
| 2778. A. M. Clark.                                | 3814. J. Frazer and W. Naar.                         |

### PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

- |                          |                    |
|--------------------------|--------------------|
| 549. H. Bright.          | 594. W. E. Gedge.  |
| 582. I. L. Pulvermacher. | 603. H. Robertson. |
| 554. C. J. Caumon.       | 625. J. Young.     |
| 576. T. Spencer.         | 668. W. H. Berry.  |
| 577. J. Petrie, jun.     | 598. H. Wilson.    |
| 872. A. V. Newton.       | 614. J. B. Booth.  |

### PATENTS ON WHICH THE STAMP DUTY OF £100 HAS BEEN PAID.

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|------------------|------------------------------|
| 489. R. Waller.  | 392. E. Green and J. Newman. |
| 617. T. H. Wood. |                              |